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DESCRIPTIVE AND GENERAL

CATALOGUE

OF

PHILOSOPHICAL APPARATUS

AND

Chemical Preparations,

MANUFACTURED AND SOLD BY

BLAND & LONG,

OPTICIANS,

PHILOSOPHICAL, PHOTOGRAPHICAL, & CHEMICAL INSTRUMENT MAKERS,

AND

OPERATIVE CHEMISTS,

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1854.

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By exchange of
Duplicates
19 August 1858

SCIE ARY

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1858. Aug. 19.
By exchange of duplicates.

LONDON:
H. SILVERLOCK, PRINTER, DOCTORS' COMMONS.

ADDRESS.

Messrs. Bland and Long, in presenting to the Public the following descriptive Catalogue of Chemical, Philosophical, and Photographical Apparatus and Chemical Preparations, would take occasion to mention that nearly the whole of the Instruments and Apparatus therein described are manufactured on the premises under their own immediate supervision and direction; and from their practical acquaintance with the details of manufacture, they are enabled to offer with confidence Instruments with all the most recent improvements, combined with great moderation in price.

In the Photographic department they have consulted the requirements of the Art in the erection of a spacious Glass Operating Room, for the trial of Photographic Lenses during their manufacture, for the carrying out of experiments in Photography, and for the purposes of instruction in this beautiful Art

Purchasers of Apparatus, and others who require information respecting Instruments in any section as to their use and capabilities, will receive every instruction and information, either by letter, or personally at the Establishment, 153, *Fleet Street, London.* It is hoped that this Catalogue will be found to answer the purpose for which it has been compiled, viz., to assist the Professor, Teacher, and Student, in the selection of Apparatus and Materials essential to their particular pursuits.

Messrs. **Bland** and **Long** would feel great pleasure at all times in furnishing Estimates of complete series of Apparatus, in any particular branch of Science, to Lecturers, Public Institutions, &c. To obviate delay in the execution of orders received by post from those with whom Messrs. B. and L. have not had the pleasure of being acquainted, it is requested that a remittance by Post-office Order, or otherwise, or a reference to some house in London, may accompany such commissions.

Orders from India, and other foreign parts, must be accompanied by a remittance or order for payment in London, or any part of England; and it is particularly requested, that in order to prevent mistakes, orders sent through Agents will be explicit as to the house from which the Instruments are to be procured

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Merchants and Agents supplied on liberal terms, and wholesale orders executed with the greatest despatch.

153, Fleet Street, London,
July 1*st*, 1854

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CHEMISTRY.

This section will comprise details of the various Apparatus, Instruments, and Preparations required for the full investigation of Chemical subjects, and is intended to assist those who may not be thoroughly conversant with the science, in the selection of apparatus most suited to their several wants.

Adapters, for connecting retorts with receivers, &c. from 9d. to 3s

" with Liebig's condensing apparatus, from 7s. 6d. to 21s.

Air Jars, cylindrical, ground at the mouth:—

	£	s.	d.
per nest of six, from 10 in. by 4 in. to 8½ in. by 1⅝ in.	0	12	6
" " 6¾ " 3½ " 6¼ " 1¼	0	8	6

or singly, as follow:—

high		dr.	s.	d.	high		dr.	s.	d.
8½ in.	by	1⅝ in.	1	0	6¼ in.	by	1¼ in.	1	0
8¾	"	2	1	6	6¼	"	1⅝	1	0
9	"	2½	1	9	6⅜	"	2⅛	1	0
9½	"	3	2	3	6½	"	2½	1	3
9¾	"	3⅜	2	9	6¾	"	3	1	9
10	"	4	3	3	6¾	"	3½	2	6

or, Graduated, from 1s. 6d., to 7s.

Air Jars, bell shaped, for collecting and deflagrating gases,

	high.	dr.	capacity.	plain.	stoppered.	with brass cap for stop cock.
No. 1,	5½ in.	3½ in.	1 pint,	1s. 6d.	2s. 0d.	3s. 0d.
2,	6½ "	4 "	1½ "	2s. 0d.	2s. 6d.	3s, 6d.
3,	7¼ "	4⅝ "	2½ "	2s. 9d.	3s. 6d.	4s. 6d.
4,	8½ "	4¾ "	3½ "	3s. 6d.	4s. 6d.	5s. 6d.

Ditto, Graduated into cubic inches, from 4s. 6d. to 10s

	£	s.	d.
Air Jars, bell shaped, mounted with brass cap, two stop-cocks, connector, and bladder 12s. 6d. to	0	16	0
Alembics, with movable heads, earthenware, fr. 2s. 6d. to	0	7	6
" " Berlin porcelain, from	0	4	6
" " glass, . . from 5s. to	0	10	6
" small, of German glass, (blown), 3 oz. capacity	0	2	0

B

	£	s.	d.
Alkalimeters, for estimating the amount of real Alkali in samples of Potash, Barilla, &c., consisting of a glass tube on foot, graduated, 1000 grains, with requisite points, Soda Potash, &c. .	0	5	0
Ditto, ditto, without names . .	0	4	6
Ditto, SCHUSTER'S . . . . each	0	2	0
Ditto, FRESENIUS' & WILLS', as described in their work on Alkalimetry . . . . . 2s. and	0	3	0
Ditto, GAY LUSSAC'S Pouret for Alkalimetry, or Chlorimetry, consisting of a graduated glass tube, with spout for dropping or decanting . . .	0	7	0
Ditto, BINKS' . . . . each	0	7	6
Anvils, for Mineralogical purposes, of hardened steel, 1¼ in. square, 1s., 1½ in. sq., 1s. 6d., 2 in. square	0	2	0
Ditto, with screw, for attaching to table . . .	0	4	6
Arsenic tubes, of hard German glass, of BERZELIUS', ROSE'S, LIEBIG'S, or CLARK'S forms, according to size, from 2d. to 4d. each.			
Ditto, set of 15, assorted, in box	0	2	0
ARSENIC, Apparatus for testing, (*see* Toxicological Apparatus, *page* 37.)			
Apparatus for AGRICULTURAL CHEMISTRY (*see page* 38.)			
Ditto, ORGANIC ANALYSIS, (*see page* 36.)			
Ditto, TOXICOLOGICAL purposes, (*see page* 37.)			
ASSAY Apparatus, (*see page* 39.)			
BATHS, for Hot Air, (*see page* 29.)			
Ditto, Sand, (*see page* 31.)			
Ditto, Water, (*see page* 34.)			
Bath, for Oil, as described in FRESENIUS' work . .	1	15	0

BALANCES.

	£	s.	d.
Common, in oak boxes, with set of dram, scruple, and grain weights	0	3	6
Ditto, superior	0	5	0
Ditto, in mahogany box	0	7	0
Ditto, with glass pans, in oak box	0	7	0
Ditto, superior, in mahogany box	0	12	0
Ditto, with pillar, in French-polished mahogany box, with drawer, box-end beams, and glass pans, (one movable,) with dram, scruple, and grain weights	2	2	0

		£	s.	d.
Balances,	delicate, for Chemical analysis, with box-end beams, brass pans, extra hydrostatic pan and counterpoise, with set of decimal weights, from 500 to 1-20th of a grain, packed in French-polished mahogany box . . .	3	3	0
Ditto,	of superior kind, and larger size, (very accurate), with extra pan, glass bucket and bulb for specific gravity, decimal weights from 1000 to 1-20th of a grain, packed in French-polished mahogany box . . .	7	7	0
Ditto,	very delicate, for Chemical analysis, or assaying purposes, capable of weighing to the 100th of a grain, enclosed in a glass lantern, with weights complete . . .	12	12	0
Ditto,	ditto, for weighing to the 200th of a grain .	18	0	0
Ditto,	ditto, ditto, 1000th of a grain £30 to	50	0	0
Ditto,	ditto, for weighing gold, with Troy weights, from 15s. to	3	3	0

DECIMAL WEIGHTS.

Sets of French decimal weights, in mahogany boxes, with forceps:

	£	s.	d.
From 50 grammes to 1 millegramme .	1	15	0
" 1 kilogramme to 100 grammes .	2	10	0
" 1 " 1 millegramme	3	15	0

Sets of decimal grain weights, English, in mahogany boxes:

			£	s.	d.
600 grains	to	1-100th grain . . .	1	11	6
1000	"	1-100th " . . .	1	15	0
10000	"	1000 grains . . .	2	5	0
6000	"	1-100th grain . . .	3	3	0
10000	"	1-100th " . . .	3	10	0

		£	s.	d.
Grain weights	per set	0	0	6
Drachm and scruples	"	0	1	0

Balloons, of goldbeater's skin, for inflation by gas:

Circumference.		s.	d.	Circumference.		s.	d.
18 inches	each	1	4	36 inches	each	4	0
24 "	"	2	0	48 "	"	6	0
30 "	"	3	0	60 "	"	9	0

And larger sizes, 12s. 6d., 15s., and 20s.

	£	s.	d.
Apparatus for generating hydrogen gas for filling balloons from 7s. 6d. to	1	1	0

		£	s.	d.
Barometer tubing	per lb.	0	2	0
Barktrometers	each	0	13	0
Bars of Copper, Iron, Zinc, Tin, Antimony, &c.	"	0	0	3
Ditto, set of, in box, for precipitation . .	"	0	1	0
Basins for Evaporation, &c. *(See page* 17.)				
Beaker glasses, of hard German glass, with turned-over tops, of equal thickness, sides and bottoms ;—				
Nest of 3, size of largest 4 in. by 2¼ in., smallest 3 in. by 1¾ in.			1	9
" 5, " 5½ " — 3 " " 3 " — 1¾ "			3	3
" 8, " 8 " — 4½ " " 3 " — 1¾ "			7	6
" 12, " 10 " — 5½ " " 3 " — 1¾ "			14	0
Beakers, German glass, cylindrical shape, (long) :—				
high. dr. high. dr.				
Nest of 4, size of largest, 6¼in. by 2¾in., smallest, 4in. by 2in.			3	6
" 7, " 10½ " — 3¾ " " 4½ " — 2 "			8	0
Beakers, German glass tumbler, with spout:—				
high. dr. high. dr.				
Nest of 6, size of largest, 5½in. by 3¾in., smallest, 3½in. by 2½in.			5	6
Beakers, of best English glass & make, in sets, from 1s.6d. to			9	0
Bladders, mounted with brass ferrules, for collecting gas,	2s., 3s., and		4	0

BLOWPIPES.

Under this head are enumerated the various forms this instrument has assumed in different hands, each possessing its own peculiar advantages, according to the purposes to which it is to be applied.

		£	s.	d.
Blowpipes, bent brass, common,	each, 6d., 9d., and	0	1	0
" glass		0	1	0
" Black's, common . .	1s. and	0	1	6
" " best, with ivory mouthpiece .		0	2	6
" Bergman's, common . . .		0	3	6
" " best, with two jets and ivory mouthpiece		0	5	0
" Pepy's, with movable jet . . .		0	5	6
" Gahn's, with ivory mouthpiece, and extra jet		0	6	0
" Wollaston's, portable, for pocket .		0	6	6
" straight or curved, with joint for attaching to stopcock for gases . . .		0	2	6

FOR OIL.

	£	s.	d.
Blowpipes, Glasse's, with lamp and tray, for bending glass tubes, &c. . . 7s. 6d. and	0	10	6
" Tilley's hydraulic jap. tin, & lamp, 15s., 18s., &	1	1	0
" " copper . . 30s. and	2	0	0
" Danger's, with bladder and cramp, for attaching to table . . 21s. to	4	4	0
" lamp and tray, japanned tin, 3s. 6d., 5s., and	0	6	0
" Glassblower's table, with double-action bellows, lamp, jets and stand complete, 4, 5, and 6 guineas.			

FOR SPIRIT.

Blowpipe, self-acting spirit, for bending glass tubes, with copper ball	0	6	0
" in brass, superior make, for igniting crucibles in analyses	0	10	0
" copper, with support and ring . . .	0	16	0

FOR GAS.

Blowpipe, Herapath's gas, adapted to screw on to an ordinary gas branch, with arrangement for producing any size jet	0	7	6
" Gurney's oxy-hydrogen . from 30s. to	2	2	0
Safety Jet, Hemming's, for burning the mixed gases, 15s. and	1	1	0
" Maugham's, " 12s. 6d. and	0	18	0
" Daniel's, " 10s. and	0	15	0
Oxy-hydrogen Jet, Palmer's, on brass stand, with silk valves, wire gauze chamber, &c., a very safe instrument for burning the mixed gases	1	1	0
" with lime-holder attached . .	1	10	0
" with stop-cocks and bladders . .	2	0	0
" with India-rubber bags and tubes, instead of bladders . . .	3	5	0
" very complete, with wedge-shaped India-rubber bags, holding 1 and 2 cubic feet of gas each, with pressure boards, stop-cocks, flexible tubes and fittings, complete	10	10	0

BLOWPIPE APPARATUS.

To the Mineralogist and those connected with the purchase and sale of metallic ores, the Blowpipe is an invaluable instrument: by it, with the assistance of a few fluxes and re-agents, a proximate value can be set on any mineral substance under examination, without the tedious process of a regular assay.

		£	s.	d.
No. 1.	The following apparatus and chemicals packed in japanned tin case for the pocket: blowpipe, wax candles, steel hammer and anvil, platina forceps, hard glass tubes, arsenic and bulb tubes, charcoal borer and holder, charcoal, pestle and mortar, Platinum foil and wire, Copper and Tin wire, Litmus, Turmeric, Lead and Brazil test papers, Borax, Carbonate of Soda, and Microcosmic Salt	1	1	0

Larger and more complete assortment of apparatus and re-agents in cases, for examination and analysis of minerals by the Blowpipe:

No. 2. £2 12s. 6d. No. 3. £3 13s. 6d. No. 4. £5 5s.

		£	s.	d.
No. 5.	Ditto, arranged for the detection and examination of Gold, Silver, and Platina ores, with guide complete	1	10	0

PLATTNER'S BLOWPIPE APPARATUS.

The following are the instruments recommended by Dr. Muspratt, in his translation of "*Plattner, on the Blowpipe.*"

		£	s.	d.
Blowpipe, lamp, and stand	7s. and	0	14	0
“ GAHN'S, with two brass jets		0	6	0
“ “ German silver, with two platinum jets		0	13	0
Charcoal furnace	4s. and	0	7	6
“ borers	2s. and	0	4	6
Cutting plyers	2s. and	0	4	6
Clay basin mould of boxwood		0	1	6
Cupels	from per doz. 8d. to	0	2	6
Cupel, Apparatus for forming . .	from 4s. 6d. to	0	10	6
Lead measurer		0	2	0
Magnifying glasses . .	1s. 6d., 2s., 3s. 6d., and	0	4	0
Magnetic needle and stand in case.		0	9	0
Mineralogical hammers		0	3	6
“ anvils . . .	1s., 1s. 6d., and	0	2	0
Mortar (steel crushing).		0	14	0
Agate ditto	from 5s. 6d. to	1	1	0

		£	s.	d.
Platinum spoon and handle	4s., 7s. 6d., and	0	10	0
" wires	6d. and	0	1	0
" wire holder	2s. and	0	4	0
" forceps	3s., 5s., and	0	7	6
Spatulas, (steel)	8d. to	0	1	6
Sieves of Brass for sifting lead powder		0	2	6
Spirit Lamps, *(see page 25.)*				
Balances, &c., *(see page 4.)*				
Bolognian flasks	each 3d. and	0	0	6

BOXES AND CABINETS OF MINERALS AND GEOLOGICAL SPECIMENS.

		£	s.	d.
No. 1.	Boxes of mineral fragments for the blowpipe	0	2	0
No. 2.	Ditto, ditto, containing from 60 to 84 named specimens for blowpipe or chemical analysis, 12s and	0	15	0
No. 3.	Cabinet, containing 150 specimens of Minerals, in three trays, scientifically arranged according to Phillips, named and numbered	2	2	0
No. 4.	Ditto, ditto, containing 200 larger specimens, in four trays	3	13	6
No. 5.	Ditto, ditto, consisting of more extensive series, and larger specimens, named and numbered	10	10	0
No. 6.	Ditto, ditto, larger specimens	20	0	0
No. 1.	Cabinet, containing specimens of Geological strata, in three trays	2	2	0
No. 2.	Ditto, ditto, more numerous with organic remains	2	12	6
No. 3.	Ditto, ditto, with collections of shells, containing each of the Linnæan Genera, with Linnæan and Lamarkian names, upwards of 120 specimens	3	15	0

BOTTLES.

Bottles of best flint glass, accurately stoppered:—

	Narrow mouth.							Wide mouth.					
		s.	d.		s.	d.		s.	d.		s.	d.
1 oz. capacity,	each	0	5	per doz.	4	6	each	0	5	per doz.	4	6
2 oz. "	"	0	6	"	5	6	"	0	6	"	5	6
4 oz. "	"	0	8	"	7	0	"	0	9	"	8	0
8 oz. "	"	0	10	"	9	0	"	1	0	"	11	0
20 oz. "	"	1	0	"	10	6	"	1	2	"	14	0
32 oz. "	"	1	4	"	14	6	"	1	6	"	16	6

Bottles, narrow mouth, German glass, stoppered:—

		s.	d.			s.	d.
1 oz.	. . each	0	6	8 oz.	. . each	0	9
2 oz.	. . "	0	6	12 oz.	. . "	0	11
4 oz.	. . . "	0	7	16 oz.	. . "	1	0
6 oz.	. . "	0	8	20 oz.	. . "	1	3

Bottles, stoppered, with enamel labels, for re-agents, as follow:— Acid Sulphuric, Nitric, and Hydrochloric, Ammonia and Potash Sol., &c.:—

			s.	d.				s.	d.
2 oz.	capacity,	each	2	0	8 oz.	capacity,	each	3	0
4 oz.	"	"	2	6	12 oz.	"	"	3	6

And 20 oz. capacity, each 4s.

Bottles, with stoppers and ground caps, for acids and volatile substances:—

			s.	d.				s.	d.
½ oz.	capacity,	each	1	9	8 oz.	capacity,	each	3	6
1 oz.	"	"	2	0	12 oz.	"	"	4	0
2 oz.	"	"	2	3	20 oz.	"	"	4	6
3 oz.	"	"	2	6	30 oz.	"	"	5	0
4 oz.	"	"	2	9	40 oz.	"	"	6	0
6 oz.	"	"	3	0					

Ditto, with ground cap and stopper, with enamel labels . . . . from	0	4	6
Bottles, with elongated stoppers, for Aqua Fortis, or Nitrate of Cobalt, in blowpipe experiments, &c., from	0	1	9
Ditto, made out of tube, for small quantities as specimens . . . . plain, per doz., from	0	1	6
Ditto, ditto, ditto, stoppered, per doz.	0	6	0
Ditto, specific gravity, containing 250, 500, or 1,000 grains each, marked at neck . . . plain	0	1	6
Ditto, ditto, 250 or 500 grains, stoppered, each	0	3	6
Ditto, ditto, ditto, with counterpoise and case, complete	0	7	6
Ditto, containing 1000 grains . . . stoppered	0	4	0
Ditto, ditto, with counterpoise and case . . .	0	8	6

Ditto, for generating Oxygen and other gases, *(see page* 22.)

Ditto, WOULFE's, with three apertures at top, ground smooth inside for corks:—

10 oz. capacity, 2s., 20 oz. 3s., and 40 oz. 4s. 6d.

Bottles, Wolfe's, with two apertures at top, and one at side:—				
10 oz. capacity, 2s. 6d., 20 oz. 3s. 6d., and 40 oz. 5s.				
Ditto, ditto, with two apertures at top:—				
10 oz. capacity, 1s. 9d., 20 oz. 2s. 9d., and 40 oz. 3s. 9d.				
Ditto, iron, for generating oxygen	7s. 6d. to	1	1	0
Ditto, (washing) with corks and tube	1s. and	0	2	0
Candle bombs	per doz.	0	0	4
Caoutchouc, for connecting glass tubes.	per sheet	0	1	0
Ditto, tubing, with wire inside (woven).	per foot	0	1	6
Ditto, varnish	per oz.	0	0	3
Ditto, bags, (bladder shape) for containing small quantities of gas.	each 10s. 6d. to	1	1	0
Ditto, bags (wedge shape) very stout, for bearing great pressure, with large stop-cock attached:—				
To hold 1 cubic foot of gas		1	15	6
" 2 "		2	12	6
" 3 "		3	3	0
" 4 "		3	15	0
" 8 "		6	0	0

Larger sizes made to order.

It is preferable, if more gas be required for consumption, to use two bags of medium size rather than one of great capacity, as the risk of accident or leakage is much less in the former than in the latter case.

Pressure boards and weights for the above, price according to size.				
Caps of brass for Air Jars, with stop-cock screws, of sizes	from 1s. to	0	2	6
Capsules, Porcelain, Glass, Platinum, and Silver, *(see page* 18.)				
Carbonic Acid Apparatus, Davy's, for testing the amount of Carbonic Acid in samples of alkalies and calcareous soils		0	2	6
Cement for attaching glass to brass	per lb.	0	2	0
Chauffers of cast iron	each 3s. to	0	4	6
Ditto, of iron plate, with top and chimney, as described in "Reid's Chemistry,"	each	0	10	0
Christison's Apparatus for the detection of poisons, *(see page* 37.)				
Chloride of Calcium tubes	straight, each 6d. and	0	1	0
Ditto, single bulb, 8d. and 1s.	Double bulb.	0	1	3

	£	s.	d.
Chlorimeters, Crum's, for testing the strength of bleaching liquors, with directions . .	0	7	0
Gay Lussac's Pouret	0	7	0
Ditto, Apparatus for testing the strength of bleaching liquids, consisting of Apparatus and Chemicals, with instructions for use . . the set	2	2	6
Clarke's Retort and Condenser, of German tube . .	0	2	6
Connecting-pieces for uniting stop-cocks with screws at each end . . . . . . 10d. and	0	1	0
Ditto, square or angle	0	1	6
Ditto, T or union pieces	0	2	0
Ditto, for mounting bladders. . . . 10d. and	0	1	0
Condensers, Liebig's . . . . from 7s. 6d. to	1	1	0
Cocks of Glass, from 5s. upwards.			
" Brass, " 3s. "			
Combustion tubes . . . . . . each 8d. and	0	1	0
Cooper's Receivers, for collecting the gases absorbed by water, without the use of a mercurial trough, 9d. to	0	2	0
Corks, of best quality, from 4s. to 7s. 6d. per gross.			
Cork-borers . . . . per set of 9,	0	3	0
Ditto, ... " 12,	0	4	0

CRUCIBLES.

Crucibles, of best earthenware, London make:

Triangular.		s.	d.	Round.		s.	d.
½ in.	. per doz.	0	3½	3 in.	. per doz.	0	10
1 "	. "	0	4	4 "	. "	1	6
1½ "	. "	0	5	4½ "	. "	1	9
2 "	. "	0	7	5 "	. "	2	0
3 "	. "	0	10	5½ "	. "	2	6
3½ "	. "	1	1	6 "	. "	3	6
4 "	. "	1	4	6½ "	. "	4	6
4½ "	. "	1	8	7 "	. "	6	0
5 "	. "	2	1	8 "	. "	8	0
Nest of 4 useful sizes		0	4	9 "	. "	11	0
" 6 "		0	9	10 "	. "	15	0
				Nest of 4 useful sizes		0	4
				" 6 "		0	9

Covers, 6d. and 1s. per dozen extra.

Crucibles, skittle pots, from 2d. to 1s. 6d. each.

Ditto, black lead:—

Nest of 3 useful sizes . . .	9d.
" 4 "	1s. 3d.
" 6 "	2s. 4d.

Ditto, Cornish:—

		s.	d.			s.	d.
3 in.	. per doz.	1	6	6 in.	. per doz.	5	6
4 "	. "	2	0	7 "	. "	8	0
5 "	. "	3	6	8 "	. "	12	0

Or, the small sizes, nested, in sets 1s. and 1s. 6d. each.

Ditto, Hessian:—

	s.	d.		s.	d.
3 in a nest . .	0	5	6 in a nest . .	1	4
4 " . .	0	8	7 " . .	2	0
5 " . .	1	0	—		

Ditto, Iron, in nests . . . . from 2s. to 0 3 6

Ditto, Berlin ware:—

Conical shape, with Covers.			s.	d.
No. 000.	holds ⅛th of oz.	ea.	0	4
00.	¼	"	0	6
0.	⅜	"	0	8
1.	½	"	0	10
2.	1	"	1	0
3.	2½	"	1	2
4.	5	"	1	4
5.	8	"	1	8

Cylindrical shape, with Covers.				
No. 1.	containing ½ oz.,	ea.	0	6
2.	" 1	"	0	7

Meissen ware:—

Very thin, with Covers.			s.	d.
No. 1.	holds 1-20th oz.,	ea.	0	5
2.	1-10th	"	0	5
3.	⅛th	"	0	6
4.	¼ oz.	"	0	7
5.	½	"	0	8
6.	¾	"	0	9
7.	1¼	"	0	10
8.	2	"	0	11
9.	3	"	1	0
10.	5	"	1	3
11.	8	"	1	8

Ditto, Berlin biscuit ware, for fusing Nitrate of Silver, with Covers, of two sizes:—

1 oz. capacity, 7d.	2½ oz. capacity, 8d.

Ditto, Berlin, for Assayers, with perforated Covers:—

3 oz. capacity, 1s. 3d.	6 oz. capacity, 1s. 6d.

Ditto, ROSE's, with Covers and bent tube, for the separation of Tin and Antimony . . . 0 2 6

Crucibles, stoneware, without Covers:—

	s.	d.		s.	d.
No. 1. size, each,	0	3	No. 4. size, each,	0	8
2. "	0	4	5. "	1	0
3. "	0	6	Or, five in nest,	2	9

Ditto, Silver, with Covers to use as capsules, from 6s. to 35s.

Ditto, Platinum " " 7s. 6d. to £5.

Crucible Tongs, wrought-iron, different shapes:—

Straight.	s.	d.	Bent. s.	d.	Bow. s.	d.
12 in. each,	1	0	1	3	1	6
14 "	1	3	1	6	1	9
16 "	1	6	1	9	2	0

Ditto, small, for using with Platinum, or small Porcelain Crucibles . . . . . . each 0 1 6

Ditto, Gilders' Tongs, bright:—

5 in., 1s. 6d. | 8 in., 2s. | 12 in., 2s. 6d.

	£	s.	d.
Crucible Jackets, iron plate . . . . . each	0	2	0
Crucible Stands . . . . . . from 1d. to	0	0	6
Cubic inch Tubes, divided into 1-10th & 1-100th cubic in.	0	3	6
Ditto, with glass stopper	0	4	6
Ditto, Bottle, "	0	3	6
Ditto, with counterpoise and case	0	6	0

Cuff's Scale of Chemical equivalents:—

Plain, 5s. 6d. | Varnished, 6s. 6d.

Cupels, from 8d. to 2s. 6d. per dozen.

	£	s.	d.
Cupel Mould . . . . from 4s. 6d. to	0	10	6
Cups, sm., for holding Blowpipe results, Berlin ware, each	0	0	3

CHEMICAL CHESTS.

In the following series of Chemical Chests and Portable Laboratories great care has been exercised in the selection of the tests and re-agents, to the exclusion of corrosive and deleterious compounds, rendering them suitable for the use of youths in acquiring a taste for Chemical pursuits, at the same time affording them recreation of the most instructive kind. The collections here described contain in proportion to their size and price, by far the largest assortment of Chemicals and Apparatus ever introduced into Portable Cabinets, and will be found to meet the requirements of the student and amateur.

Messrs. Bland and Long having been appointed Wholesale Agents for the sale of the Chemical Cabinets, are enabled to supply them at the same prices as the Manufacturers.

	£	s.	d.
Statham's Youth's Chemical Cabinets, without acids, or any dangerous or deleterious compound, containing upwards of 62 Chemical tests, with assortment of Apparatus, in cardboard cases. No. 1.	0	5	6
Ditto, in cedar . . . No. 2	0	7	6
Ditto, in mahogany, with lock and key No. 3	0	10	6
Statham's First Steps in Chemistry, a Companion to the above Cabinets, containing 150 select and amusing experiments	0	0	6
Statham's Students' Chemical Cabinet, containing an assortment of chemical tests and useful apparatus . . . . No. 1.	1	1	0
Ditto, larger . . . . . . No. 2.	1	11	6
Ditto, ditto . . . Nos. 3 & 4. £2 2s., and	3	3	0
Ditto, more complete, for qualitative analysis, No. 5.	8	8	0
Statham's Hydro-pneumatic Apparatus, containing in one piece of apparatus, a pneumatic trough, gasometer, and hydraulic blowpipe . No. 1.	2	2	0
Ditto, ... No. 2.	3	3	0

Ditto, with Cabinet of Chemical tests, and assortment of useful apparatus, forming an economic laboratory, useful for Schools, Lecturers, and Scientific Institutions:

No. 1. £5 5s. | No. 2. £10 10s.

Chemical Chests, arranged for Agricultural Chemistry, Analysis of Soils, &c.

No. 1. £3 3s. | No. 2. £5 5s. | No. 3. £8 8s.

Ditto, for Toxicological purposes:

No. 1. £2 2s. | No. 2. £3 3s. | No. 3. £5 5s.

Chemical Chests, arranged for the Analysis of Urine:—

No. 1. £3 3s. | No. 2. £5 5s.

Ditto, for the Analysis of Minerals:—

No. 1. £3 3s. | No. 2. £5 5s. | No. 3. £10 10s.

Ditto, for the Analysis of Gold, Silver, and Platinum ores, by the Blowpipe, (*see page* 8.)

Ditto, by the Humid way:—

No. 1. £3 3s. | No. 2. £5 5s.

Chemical Chests, arranged for quantitative or qualitative analysis, after Fresenius', Parnell, and other eminent Chemists	. from	10	10	0
LABORATORIES FITTED UP TO ORDER.				
Davy's Safety Lamp, tin, japanned	9s., and	0	10	6
Ditto, with condensing lens		0	16	0
Ditto, apparatus for the analysis of calcareous soils		1	10	0
Deflagrating jars, *see* Air Jars, bell-shaped, (*page* 3.)				
Ditto, ladles	. each	0	0	6
Ditto, with collar of brass	1s. 6d., 2s. 6d., and	0	3	6
Desiccating tubes, plain	each, 6d., and	0	1	0
Ditto, single bulb	" 8d., and	0	1	0
Ditto, double bulb		0	1	3
Diamonds, for writing on glass	. each	0	6	6
Ditto, for cutting glass, best	"	0	15	0

Digesters, (Wedgewood), with lid and handle:—

8 oz. capacity, 2s. | 14 oz., 2s. | 20 oz., 2s. 6d. each.

Ditto, Berlin porcelain, with ground lid and handle:—

8 oz. capacity, 3s. | 16 oz., 4s. | 20 oz., 5s. each.

Ditto, Berlin porcelain, egg shape:—

1½ oz. capacity, 9d. | 8 oz., 10d. each.

Dishes, for evaporating, (*see page* 17.)

Drainers, for drying crystals:—

Porcelain, basin shape,	5 in diam.,	2½ in deep,	2s.
" saucer "	5 — "	1½ — "	1s. 6d.
" bowl "	11 — "	3½ — "	6s
" bowl "	13 — "	4 — "	8s.

Ditto, funnel shape, Meissen ware:—

4½ in. deep, and	4½ in. diam.,	1s. 9d.
5½ — "	5 — "	2s. 3d.
6½ — "	7 — "	3s. 9d.

	£	s.	d.
Dropping tubes, straight . . each, 4d., 6d., and	0	0	8
Ditto, with bulb . . . each, 6d. to	0	1	0
Ditto, bottles . . . each, 8d., and	0	1	0
Drying apparatus, Ramelsburg's, copper . . .	0	9	0

EUDIOMETERS.

	£	s.	d.
Eudiometer, Hope's	0	8	0
" Mitscherlich's	0	16	0
" Ure's	0	7	6
" Volta's	0	8	6
" Pepy's	0	8	6
" Davy's	0	10	0

Evaporating dishes and capsules, Wedgewood ware:—

	s.	d.		s.	d.
2 in. diam., each	0	4	7 in diam., each,	1	8
2½ " "	0	6	8 " "	2	0
3 " "	0	8	9 " "	2	6
4 " "	0	9	10 " "	3	6
5 " "	1	0	11 " "	4	0
6 " "	1	4	12 " "	5	0

Evaporating dishes, of Berlin porcelain, the depth being about one-third the diameter, with spout:—

	s.	d.		s.	d.
1 oz. capacity, each	0	6	8 oz. capacity, each,	1	6
1½ " "	0	7	12 " "	2	0
2 " "	0	9	16 " "	2	6
3 " "	0	10	30 " "	3	6
4 " "	1	0	Larger sizes, up to		
5 " "	1	3	800 oz. . .	28	0

Evaporating dishes, Berlin porcelain, shallow, with spouts and flat bottoms:—

	s.	d.		s.	d.
1 oz. capacity, each,	0	6	6 oz. capacity, each,	1	3
1½ " "	0	9	8 " "	1	6
3 " "	0	10	14 " "	2	0
4 " "	1	0			

Evaporating dishes, Berlin porcelain, hemispherical shape:—

	s.	d.		s.	d.
15 oz. capacity, each,	2	6	75 oz. capacity, each,	5	0
25 " "	3	0	100 " "	6	0
35 " "	4	6			

Evaporating dishes, Berlin porcelain, without spout, very thin, useful for weighing in analysis :—

	s.	d.		s.	d.
⅛ oz. capacity, each,	0	3	½ oz. capacity, each,	0	8
¼ " "	0	5	1 " "	0	10
⅜ " "	0	6	1½ " "	1	0

Evaporating dishes, Meissen ware, very thin, the depth being about one-third the diameter :—

	s.	d.		s.	d.
1 oz. capacity, each,	0	6	8 oz. capacity, each,	1	6
2 " "	0	8	16 " "	2	0
4 " "	0	10	30 " "	3	0
6 " "	1	2	40 " "	4	0

Evaporating dishes, or capsules, Meissen porcelain, with flat bottoms :—

1 oz. capacity, each, 3d. | 1½ oz. capacity, each, 4d.

Capsules of Berlin or Meissen porcelain :—

Straight handles & spout.	s.	d.	**Ring handles & spout.**	s.	d.
No. 1. ¾ oz. capa., ea.,	0	10	No. 1. . each,	0	7
No. 2. 2 " "	1	0	No. 2. . . "	0	8
No. 3. 5 " "	1	2	No. 3. . . "	1	0
No. 4. 6 " "	1	4	No. 4. . . "	1	8

Evaporating dishes, German glass, hemispherical, with spouts :—

	s.	d.		s.	d.
2¼ in. diam., each,	0	6	4¾ in. diam., each,	1	6
2¾ " "	0	8	5¼ " "	2	0
3¾ " "	1	0	8½ " "	3	6

or, set of 10, from 2¼ in. to 6¼ in. diameter, 15s.

Evaporating dishes, Copper, from 1s. 6d. each.

Ditto, or capsules, Platinum, from 5s., upwards.

Ditto, Silver " 3s. 6d. "

Ferrules, brass, for necks of bladders, each, 10d. and	0	1	0
Files, round or rat's tail, with handles, each, 6d. to	0	1	0
Ditto, triangular " " 6d. to	0	0	9
Ditto, flat, " " 6d. to	0	1	0
Filtering paper, coarse . . . . . per lb.	0	1	2
Ditto, fine . . . . per quire	0	1	3
Ditto, Swedish . . . . . per lb.	0	4	6

Filters, cut circular :—

In Sets of 100.	s.	d.	In Sets of 100.	s.	d.
2 in. dia., 3d., or in tin box,	0	9	4½ in. dia., 8d., or in tin box,	1	4
2¼ " 3d., "	0	9	5½ " 1s. 0d., "	2	0
2¾ " 5d., "	1	0	7½ " 1s. 4d., "	2	9
3¾ " 7d , "	1	3			

Filter dryers, for hot water, Wedgewood ware, in one piece, 2s.

Ditto, Berlin ware 0 2 6

Ditto, Wedgewood ware, in two pieces :—

3 oz. capacity, 1s. 2d. | 4 oz. capacity, 1s. 4d.

Ditto, Berlin ware :—

3 oz. capacity, 2s. 6d. | 4 oz., 3s. 3d. | 5 oz., 5s.

Filter holders, funnel shape, Meissen ware :—

4¾ in. diam., 2s. | 5½ in., 3s. | 6½ in., 4s.

Filter rings . . . . each, 3d., 6d., and 0 0 8

Fire clay . . . . per lb. 0 0 2

Flasks, hard glass, flat bottoms, with ring mouth for corks :—

		s.	d.			s.	d.
1 oz. capacity,	each,	0	3	8 oz. capacity,	each,	0	10
2 "	"	0	4	10 "	"	1	0
3 "	"	0	5	16 "	"	1	3
4 "	"	0	6	30 "	"	2	0
6 "	"	0	8	40 "	"	2	6

Flasks, hard glass, globular bottoms :—

8 oz. capacity, 10d. | 16 oz., 2s. | 24 oz., 2s. 6d.

Flasks, hard glass, pear shaped, with flat bottoms and lip :—

4 oz. capacity, 8d.	10 oz. capacity, 1s.	32 oz. capacity, 2s.
6 " 10d.	20 " 1s. 6d	40 " 2s. 6d.

Flasks, hard glass, oval-shaped, thin, with lip :—

3 oz. capacity, 8d.	10 oz. capacity, 1s.	24 oz. cap., 1s. 6d.
6 " 10d.	16 " 1s. 3d.	32 " 1s. 9d.

Flasks, Florence . . . . 3d. each, or 2s. 6d. per dozen.

Ditto, with bent tube, for generating oxygen . from 0 1 0

Ditto, with ground tube, for generating gases . " 0 5 0

Ditto, with funnel and bent tube for ditto . . " 0 1 6

Ditto, with purifier annexed . . . . " 0 2 6

Forceps, with Platinum points . . 3s., 5s., and 0 7 6

FUNNELS, best flint glass, ribbed at sides:—

	s.	d.		s.	d.
2 in. diameter, each,	0	4	4 in. diameter, each,	0	7
2¼ “ “	0	4	5 “ “	0	9
2½ “ “	0	6	6 “ “	1	0
3 “ “	0	6	7 “ “	1	6

Funnels, Wedgewood ware, cream color, glazed and fluted inside:

	s.	d.		s.	d.
2 in. diameter, each,	0	5	5½ in. diameter, each,	1	8
2½ “ “	0	5	6 “ “	2	0
3 “ “	0	7	6½ “ “	2	6
3½ “ “	0	8	7 “ “	3	0
4 “ “	0	10	8 “ “	3	6
4½ “ “	1	0	8½ “ “	3	6
5 “ “	1	4	9 “ “	4	6

Funnels, Wedgewood stoneware, fluted inside:—

	s.	d.		s.	d.
2 in. diameter, each,	0	8	6 in. diameter, each,	3	0
2½ “ “	0	8	6½ “ “	3	6
3 “ “	0	10	7 “ “	4	0
3½ “ “	1	0	7½ “ “	4	6
4 “ “	1	4	8 “ “	5	0
4½ “ “	1	8	8½ “ “	5	6
5 “ “	2	0	9 “ “	5	6
5½ “ “	2	6			

Funnels, Meissen ware, skeleton, to hold a paper filter:—
4½ in. diam., 2s. | 5½ in. diam., 3s. | 6½ in. diam. 4s.

Funnels, Meissen ware, ribbed inside:—
2 in. diam., each, 1s. 6d. | 3¾ in. diam., 1s. 10d.

Funnels, small, Berlin porcelain, with handle, each,	0	0	6
Ditto, Meissen “ without handle, “	0	0	6
Ditto, draining, Berlin “ with handle, “	0	0	8

Ditto, Meissen “ without handle:—
4½ in. diameter, each, 1s. 9d. | 5 in., 2s. 3d. | 7 in., 3s. 9d.

Funnels, German glass, with stopcock, 1 pint capacity	0	8	0
Ditto, tube, for introducing fluids into retorts, &c., straight, 10 in. long, 8d., 14 in. long,	0	0	9
bent . . . . each,	0	1	0
Ditto, safety, plain . . . . “	0	1	6

	£	s.	d.
Funnels, safety, one bulb . . . . . each	0	2	0
Ditto, two bulbs . . . "	0	2	6
Funnel holders, Wedgewood ware, each, 3d., 6d., and	0	0	8

FURNACES.

The Furnace, forming as it does, one of the principal items in the fitting-up of a Laboratory, ought to be selected with reference to the kind of operations most likely to be performed with it.

The requisites for a good Furnace for Chemical purposes, are, large heating surface for sand-bath, distillery, &c., economy in fuel, arrangements for the introduction of crucibles, muffles, tubes, &c., into the fire, and a perfect plan for the regulation of the heat.

Aikin's Blast Furnaces, of black lead:

		s.	d.			£	s.	d.
No. 1.	4 in. diameter,	8	0	No. 4.	6 in. diam.,	1	1	0
No. 2.	5 "	12	0	No. 5.	7 "	1	7	6
No. 3.	5½ "	16	0					

	£	s.	d.
Assay Furnaces, for cupellation . . from £4 to	8	0	0
Black's Oval Furnace, lined with firebrick, with chimney, sand bath, &c., best make . .	6	0	0
Brande's Furnace, for laboratory use . £17 10s. to	21	0	0
Charcoal furnaces, *see* Chauffers, (*page* 11.)			
Evaporating ditto, with fireclay grates . from 4s. to	0	8	0
Furnace, for Organic analysis . . . from 5s. to	0	10	0
French pattern Furnace, of best English clay . .	1	1	0
Ditto, black lead . . .	1	5	0
Gas Furnace, for evaporation . from 3s. to	0	10	0
Ditto, as described in Mohr & Redwood's Pharmacy, from 12s. to	1	1	0
Knight's Portable Furnace . . £3 13s. 6d., and	5	5	0
Luhme's Furnace, with sand bath and jacket, complete, from £1 10s. to	4	0	0
Lamp Furnace, Griffin's, complete	0	8	0
Round Iron Furnace, lined with fire clay, very suitable for the laboratory	3	3	0
Ditto, larger size, with sand bath, muffles, &c. . . .	4	4	0

Universal Furnaces, of black lead:

		£	s.	d.			£	s.	d.
No. 1.	. each,	0	10	0	No. 4.	. each,	1	5	0
No. 2.	. .	0	15	0	No. 5.	. .	1	10	0
No. 3.	. .	1	0	0	No. 6.	. .	2	2	0

	£	s.	d.
Portable iron Forges, with double bellows, £6., £8., and	10	10	0
Tongs, of all kinds, for furnaces, *see* Crucible Tongs, (*page* 14.)			
Cupels, (*see page* 14.)			
Cupel Moulds, (*see page* 14.)			
Double bellows, with stand for blast furnaces from £1 10s. to	2	2	0

GAS APPARATUS.

Gas-holders, of zinc or japanned tin, Pepy's:—

		£	s.	d.			£	s.	d.
2 gallons .	. each	0	12	0	8 gallons.	. each	2	2	0
4 " .	. "	0	18	0	10 " .	. "	3	3	0
6 " .	. "	1	10	0	15 " .	. "	3	10	0

	£	s.	d.
Gas-holders in copper . . . . . from £1 5 to	6	0	0
Pair of large copper ditto, with funnel, connecting-pipes, and stop-cocks . . . . . £7 10s. and	12	12	0
Pneumatic troughs of zinc, with shelf:— size, 9 in. by 5 in. by 5 in.	0	3	6
Ditto, ditto, 10 in. by 7 in. by 7 in.	0	4	6
Ditto, ditto, 13 in. by 10 in. by 10 in	0	7	6
Ditto, tin, japanned inside and out:— 13in. by 10 in. by 10 in.	0	10	6
Ditto, ditto, 15 in. by 12 in. by 12 in.	0	15	0
Ditto, of larger size, and well in centre for using several jars at once, japanned tin and copper . . . £1 1s. to	4	4	0
Glass flask and bent tube for generating Oxygen gas, from	0	1	0
Ditto, with funnel and bent tube, for Hydrogen	0	2	0
Clarke's Gas-bottle, for generating gases . . .	0	2	6
Glass gas-bottle and purifier	0	3	6
Ditto, Berzelius's, for Sulphuretted Hydrogen gas, with ground tube	0	6	6
Stoneware Hydrogen generator, with bent pipe . .	0	8	0
Iron retorts and bottles for generating Oxygen, 7s. 6d., 12s. 6d., £1 1s. and upwards.			
Ditto, with purifier . . . . £1 1s. and	1	10	0
Copper retort, for generating Oxygen from Chlorate of Potash	1	1	0
Ditto, with purifier complete on stand . .	2	2	0

		£	s.	d
Lead apparatus, for generating large quantities of Hydrogen, with brass purifier	£2 10s. to	4	4	0
Gas bags, for containing gas, *see* Caoutchouc bags, (*page* 11.)				
Bladders, with ferrules	2s., 3s., and	0	4	0
Gas Jars, for receiving and deflagrating the gases, *see* Air Jars, (*page* 3.)				
Ladles, for deflagration	each	0	0	6
Ditto, with brass collars	1s. 6d., 2s. 6d., and	0	3	6
Zinc dishes, for use with deflagrating jars	6d. to	0	1	6
Mercurial troughs (*see page* 27.)				
Gas Transferer (Pepy's).		0	5	0
Glass Globe and stop-cock for taking specific gravity of gas		0	5	6
Gay Lussac's Tube and Retort-holder	from 7s. to	0	15	0
Gahn's " "	" 7s. "	0	15	0
Geological Cabinets, (*see page* 9.)				
" hammers	2s. 6d. to	0	7	6
Glass rods for stirring	each 2d., 3d., and	0	0	4
" in lengths	per lb.	0	2	0
Glass tubing, flint glass, fine quill.	"	0	4	0
" " strong	"	0	2	6
" from ⅓ in. to ¾ in. diameter	"	0	1	6
" German glass, fine quill.	"	0	4	0
" " strong	"	0	3	0
" " medium sizes, assorted,	2s. 6d., &	0	4	0
" " Barometer	per lb.	0	2	0
" " Capillary	"	0	4	0
Goniometers, for ascertaining the angles of crystals		0	12	0
Ditto, Wollaston's, Reflecting		4	4	0
Gravimeters, (*see page* 24.)				
Hydrogen Lamps	from 7s. 6d. to	3	3	0

HYDROMETERS, SACCHAROMETERS, ETC.

	£	s.	d
Hydrometer, Sykes' Improved metal, with Thermometer, in case, glass, and book of directions	4	4	0
Ditto, metal, in case, with Thermometer	2	2	0
Ditto, glass, in tin case	0	5	0
Ditto, specific gravity, for acids or liquids heavier than water, from 1000· to 1850· on paper scale, in case	0	7	0

	£	s.	d.
Hydrometer, with ivory scale, in case, 1000° to 1850°	0	9	0
Ditto, for liquids lighter than water, in case . .	0	8	0
Ditto, for oil, with Thermometer	0	10	6
Ditto, portable, in sets, in mahogany cases, ranging from water to sulphuric acid:—			
Set of two	1	1	0
Set of four	1	16	0
Set of, ranging from Sulphuric Æther to Sulphuric Acid, with Thermometer, in case, .	3	3	0
Ditto, Beaume's, for Saline solutions . . from	0	9	0
Ditto, Twaddle's . . each, from 5s. to	0	8	0
Ditto, " set of six, in mahogany case, with Thermometer and glass . . .	2	5	0
Hydrometer, for Milk, *see* Lactometers, (*page* 25.)			
Ditto, Negretti's Improved, with Thermometer in the stem, for ascertaining temperature and strength at the same time	2	2	0
Saccharometer, metal, with slide rule, in mahogany case, best make	5	5	0
Ditto, Beaume's, brass, ranging 0° to 25° .	1	1	0
Ditto, 25° to 50° .	1	1	0
Ditto, small glass, for sugar refiners . . . each	0	3	6
Ditto, ordinary size, for brewers, with ivory scale "	0	5	0
Ditto, Roberts', used in the manufacture of British wines	0	7	6
Salinometers . . . . each, from	0	7	6
Gravimeters, common tin	0	6	0
Ditto, best metal, Nicholson's, for taking the specific gravity of gold or minerals . . .	4	4	0
Urinometers, (*see page* 35.)			
Hydrometric Beads, Set of, for taking specific gravities of liquids, in tin boxes . . . from 4s. to	1	10	0
Hydrometer Glasses, spirit proofs . . 2s., 3s., and	0	4	0

India-rubber tube, Vulcanized:—

	s.	d.		s.	d.
⅛ in. bore, per foot	0	11	⅜ in. bore, per foot	1	1
¼ " "	1	0	½ " "	1	4

India-rubber Gas Bags, sheet and varnish, (*see page* 11.)

	£	s.	d.
Iron wire, for combustion in oxygen . . per hank	0	0	4

Jars, for solution, *see* Beakers, &c., *(page 6.)*

Ditto, for gas, *see* Air Jars, *(page 3.)*

Jets of various kinds, *see* Blowpipes, *(page 6.)*

		£	s.	d.
Labels, Chemical, gummed, ...	per set	0	0	6
Ditto, book of, GRIFFIN'S		0	2	0
Ditto, DE LA RUE'S		0	2	6
Lactometers, for testing the purity of milk, of gutta-percha, with directions for use		0	1	0
Ditto, Hydrometer form, in tin case		0	5	0
Ditto, with graduated glass, and outer tin case .		0	10	0
Lactometer tubes, graduated	each	0	2	0
or, Set of five, with stand		0	12	0
Ladles, iron, from ¾ in. to 12 in. diameter .	5d. to	0	7	0
Ditto, sheet iron, from ¾ in. to 1¾ in. diameter	3d. to	0	0	6
Ditto, deflagrating, with wire		0	0	6
Ditto, with air-tight collar	2s. 6d. and	0	3	6

LAMPS, (FOR SPIRIT)

Spirit Lamps, glass, with air-tight caps :—

COMMON.

Loose wick holder.	s.	d.	With fixed wick holder.	s.	d.
4 oz. capacity, each	1	6	3 oz. capacity, each	2	6
8 " "	2	6	8 " "	3	6

BEST FLINT GLASS.

1 oz. capacity,	loose wick holder,	each,	2s.
3 oz. "	fixed	"	3s.
5 oz. "	"	"	4s.
11 oz. "	"	"	5s.

		£	s.	d.
Spirit Lamps, brass	3s. and	0	5	0
Ditto, with two sliding rings, for Watch glasses or small Crucibles	5s. 6d. and	0	7	6
Ditto, BERZELIUS'S, on stand		1	6	0
Ditto, BOUTIGNY'S, Blowpipe	6s. 6d., 10s. 6d., and	0	15	0
Ditto, with spiral tube to reservoir, for keeping the Spirit cool, and Argand burner, on stand, with sliding rings		1	6	0
Ditto, ROSE'S, mounted on tin tripod stands,	12s. 6d. and	0	15	0
Ditto, on brass stand, with two sliding rings .		0	18	0
Ditto, Russian Analysis Lamp		0	15	0

	£	s.	d.
Spirit Lamp, Cooper's, for heating glass tubes, 21s. and	1	12	6
Ditto, Faraday's, in Tin	0	10	6
Ditto, " Copper	0	15	0

FOR OIL.

	£	s.	d.
Lamps, Argand, for Chemical purposes, with Cottons, 6s. 6d., 7s. 6d., and	0	8	6
Ditto, with double concentric wick . . .	0	15	0
Ditto, Fountain, with screw, to adapt to Retort stand	0	15	0
Ditto, Berzelius's Blowpipe, portable, on stand . .	0	10	0
Ditto, " with Brass Lamp	0	15	0
Ditto, Glassblower's, with tray . . . . 5s. and	0	7	6
Ditto, Davy's Safety, Tin . . . . . 9s. and	0	10	6
Ditto, " with condensing lens	0	16	0

FOR GAS.

	£	s.	d.
Gas Jet, with stopcock and chimney, with gauze top .	0	7	0
Ditto, Argand-burner, " " 8s. 6d. and	0	12	0
Gas Furnaces, (*see page* 21.)			
Lapidary's Apparatus, for cutting and polishing Minerals and Stones, complete . . . £7 7s. and	10	10	0
Liebig's Apparatus for Organic Analysis, (*see page* 36.)			
Masks of wire gauze, for protecting the face in performing Chemical experiments . . . from	0	4	6

Measures, Glass, graduated, Conical form:—

	s.	d.		s.	d.
Minim 1 dr, each	1	0	6 oz. capacity, each	2	4
" 2 "	1	3	8 " "	2	9
" 1 oz. "	1	3	16 " "	3	6
" 2 "	1	4	20 " "	4	0
" 4 "	2	0	40 " "	7	6

Ditto, Glass, Cylindrical shape:—

	s.	d.		s.	d.
4 oz. . each	1	9	20 oz. . each	3	6
8 " . . "	2	6	40 " . "	7	0
16 " . . "	3	3	——		

Ditto, Meissen ware, glazed throughout:—

	s.	d.		s.	d.
2 oz. capacity, each	1	0	20 oz. capacity, each	3	0
4 " "	1	6	40 " "	4	0
10 " "	2	0	——		

		£	s.	d.
Mercurial Troughs, mahogany	. . . . . .	0	6	0
Ditto,	iron, to hold 7 lbs. of Mercury .	0	5	0
Ditto,	" 14 " . . .	0	7	6
Ditto,	" Pepy's, on mahogany stand, £6 to	8	0	0
Ditto,	" Newman's Improved, with Pepy's Gasometer attached, £9 9s. to	12	12	0
Ditto,	Wedgewood ware, to hold 4lbs. Mercury	0	2	0
Ditto,	Berlin ware, " 4lbs. "	0	2	6
Ditto,	Wedgewood ware, " 10lbs. "	0	3	0
Ditto,	Berlin ware, " 10lbs. "	0	8	0
Graduated Jars for ditto	. . . from 1s. to	0	5	0
Metallic Precipitants, Boxes of	. . . . each	0	1	0
Mineralogical Apparatus, *(see page* 8.)				
Minerals, Collections of, *(see page* 9.)				
Models of Crystals, in sets	. . . from 7s. 6d. to	1	1	0

MORTARS AND PESTLES.

Common semi-Porcelain, conical or hemispherical shapes, outside measurement:—

	s.	d.		s.	d.
2½ in. diam., each	0	8	4½ in. diam., each	1	6
3 " "	0	9	5½ " "	2	0
3½ " "	1	0	6 " "	2	6

Best Wedgewood ware, to resist Acids, and not liable to stain; outside measurement:—

	s.	d.		s.	d.
1 in. diameter, each	0	8	6 in. diam., each	4	0
1½ " "	0	8	6½ " "	4	6
2 " "	1	0	7 " "	5	0
2½ " "	1	4	7½ " "	6	0
3 " "	1	8	8 " "	7	0
3½ " "	2	0	9 " "	9	0
4 " "	2	4	10 " "	11	0
4½ " "	2	9	11 " "	14	0
5 " "	3	0	12 " "	16	0
5½ " "	3	6			

Berlin ware, glazed outside:—

	s.	d.		s.	d.
2 in. diam., each	0	9	4½ in. diam., each	3	6
3½ " "	2	4	5 " "	4	6

Mortars and Pestles, Berlin ware, glazed throughout:—

5½ in. diam. each, 3s. 6d. | 7 in., 5s. 6d. | 8½ in., 7s. 6d.

Meissen ware, for mixing substances in Organic Analyses:—

	s.	d.
2¾ in. diameter, and 1¼ in. deep, each	2	0
3½ " " 1½ " "	2	6
4½ " " 2 " "	3	0
5½ " " 2¼ " "	4	0

Meissen ware, conical form:—

	s.	d.
3¼ in. diameter, and 2 in. deep, each	3	3
4½ " " 2¾ " "	4	6
5 " " 3¼ " "	6	0

Glass, polished at bottom:—

	s.	d.		s.	d.
2 oz. capacity, each	1	6	20 oz. capacity, ea.	5	0
5 " "	2	0	30 " "	6	6
10 " "	3	0	40 " "	7	6

Mortars and Pestles, Agate, each, 5s. 6d., 8s., 10s., 12s., to 1 15 0

Ditto, Steel, for crushing diamonds, &c. 0 14 0

Ditto, Iron, outside measurement:—

Bowl shape.	s.	d.	Bell shape.	s.	d.
4 in. diam., conts 10 oz.	2	6	4 in. diam., conts 10 oz.	1	9
5 " " 20 "	4	0	5 " " 20 "	2	6
6¼ " " 40 "	5	0	6½ " " 60 "	5	0
7¼ " " 60 "	6	0	7 " " 80 "	6	0

Muffles, Earthenware:—

	s.	d.		s.	d.
4 in. plain, each,	0	9	or, with round holes or slits	1	0
5 " "	1	0	" "	1	3
6 " "	1	3	" "	1	6
7 " "	1	6	" "	1	9
8 " "	2	0	" "	2	6

Ditto, small, for Portable French Furnaces:—

4 in. 1s., 5 in. 1s. 3d., and 6 in. 1s. 6d. each.

Oil Lamps, *see* Lamps, *(page* 26.)

Oil Bath, as recommended and figured in FRESENIUS' Analysis £1 15s.

Organic Analysis, Apparatus for, *(see page* 36.)

Oxygen Gas, Apparatus for generating, *(see page* 22.)

	£	s.	d.
Oxygen Jets, to attach to stopcocks	0	2	6
PEPY's Balneo, for drying precipitates at temp. 212° .	0	10	0
Pipettes, or Dropping Tubes, various shapes, 4d., 6d., and	0	0	8
Philosophical Candle, for producing musical sounds with Hydrogen gas, with glass tube, complete . .	0	5	0
Plates of Glass, for covering Air Jars, from 6d. each.			
Pneumatic Troughs, zinc, with shelf:—			
9 in. by 5 in., by 5 in., each	0	3	6
Ditto, 10 " 7 " 7 "	0	4	6
Ditto, 13 " 10 " 10 "	0	7	6
Ditto, tin, japanned inside and out:—			
13 in. by 10 in., by 10 in. each,	0	10	6
Ditto, 15 " 12 " 12 "	0	15	0
Ditto, of larger size, and well in centre, for using several Jars at once, japanned tin or copper . 21s. to	4	4	0
Platinum Capsules, from 5s., upwards.			
" Crucibles, with Capsule covers, from 7s. 6d. to	5	0	0
" Forceps . . . . . from 2s. 6d. to	0	15	0
" Spatulas . . . . . . " 10s. "	1	1	0
" Spoons . . . . . " 1s. 6d. "	0	10	6
" Wire and Foil . . . . per oz., variable.			
Potash Tube, LIEBIG's, with five bulbs, in case . .	0	3	0

Precipitating, or Test Glasses, on feet, various shapes:—

	s.	d.		s.	d.
1 oz. capacity, each	0	8	4 oz. capacity, each	1	0
1½ " "	0	9	6 " "	1	3
2 " "	0	10	8 " "	1	6

Ditto, PHILLIPS's, conical form:—

Capacity.	high.		s.	d.	Capacity.	high.		s.	d.
2 oz.	2½ in.	each	0	7	8 oz.	4½ in.	each	0	9
4 "	3½ "	"	0	8	16 "	5½ "	"	1	0
6 "	4 "	"	0	9	26 "	6½ "	"	1	9

	£	s.	d.
RAMMELBURG's Drying Apparatus	0	9	0
REID's Mouthpieces, for inhaling Nitrous Oxide, 1s. 6d. &	0	2	6
Reduction Tubes, German glass, 12 in. long:—			
Straight, or one bulb . . .	0	1	0
Two bulbs . . .	0	1	3

Retorts, Earthenware:—

	s.	d.		s.	d.
¼ pint capacity, ea.,	0	6	2 pints capacity, ea.,	2	0
½ “ “	0	10	3 “ “	2	9
1 “ “	1	2	4 “ “	3	6
1½ “ “	1	8	6 “ “	4	6

Tubulated and Stoppered, 2d. to 6d. extra.

Ditto, best flint Glass:—

Plain.	s.	d.	Tubulated.	s.	d.
2 oz. capacity, each	0	4	2 oz. capacity, each	1	0
4 “ “	0	8	4 “ “	1	3
10 “ “	1	0	10 “ “	1	9
20 “ “	1	3	20 “ “	2	3
40 “ “	1	9	40 “ “	3	6

Ditto, hard German Glass:—

Plain.	s.	d.	Stoppered.	s.	d.
2 oz. capacity, each	0	6	2 oz. capacity, each	1	0
3 “ “	0	6	3 “ “	1	2
4 “ “	0	6	4 “ “	1	3
6 “ “	0	8	6 “ “	1	4
8 “ “	0	9	8 “ “	1	6
12 “ “	1	0	12 “ “	2	0
16 “ “	1	3	16 “ “	2	6
24 “ “	1	9	24 “ “	3	0
40 “ “	2	6	40 “ “	4	6

Ditto, Berlin porcelain:—

Plain.	s.	d.	Stoppered.	s.	d.
3 oz. capacity, each	2	6	3 oz. capacity, each	3	6
6 “ “	3	6	6 “ “	5	0
12 “ “	6	0	12 “ “	8	0

Ditto, Stoneware, of best material:—

Plain.	s.	d.	Tubulated.	s.	d.
1½ in. diam. of bowl	2	0	1½ in. diam. of bowl	2	8
2 “ “	2	9	2 “ “	3	6
2½ “ “	3	6	2½ “ “	4	0
3 “ “	4	0	3 “ “	4	8
3½ “ “	4	8	3½ “ “	5	6
4 “ “	5	6	4 “ “	6	0

If of coarser kinds half the above prices.

Receivers, best flint Glass:—

	Plain.	Stoppered.	Quilled & Stoppered
4 oz. capacity, each	8d.	1s. 2d.	1s. 8d.
8 " "	10d.	1s. 6d.	2s.
16 " "	1s.	1s. 9d.	2s. 6d.
24 " "	1s. 3d.	2s. 4d.	3s.

Ditto, Cooper's, for collecting gas without Mercurial trough, 9d. to 0 2 0

Receiver Stand, tin . . . . . . 2s. 3d. to 0 4 6

Retort Stands:—

No. 1.	Small iron foot,	one ring . .	1s.
No. 2.	"	two rings . .	2s.
No. 3.	"	three " . .	3s. 6d.
No. 4.	Larger	three " . .	4s.
No. 5.	Large, oval foot,	three iron rings .	7s. 6d.
No. 6.	"	three brass ditto .	8s.
No. 7.	" brass pillar,	three " .	9s. to 10s.
No. 8.	" brass foot,	three large rings .	15s. to 21s.

Saccharometers, (*see page* 24.)

Salinometers, (*see page* 24.)

Safety Funnels, plain . . . . . . each 0 1 6

Single bulb . 2s. | Double bulb . 2s. 6d.

Sand Baths, iron . . . . . . each, from 4d. upwards.

Ditto, copper . . . . . " 2s. 6d. "

Scale Pans, Berlin porcelain . . . . . from 0 0 6

Scales and Weights, (*see page* 4.)

Scale of Equivalents, Cuff's, plain, 5s. 6d., varnished, 6s. 6d.

Sieves of brass wire, 6 in. diameter 0 3 0

Ditto, Set of 3, used in Agricultural Chemistry, 7s. 6d. & 0 10 6

Separating Funnels and ground cock of German glass, from 7s. 6d. to 0 14 0

Ditto, Vessels with handles and ground cock, 12s. to 0 15 0

Ditto, without handles . . . . 9s. to 0 12 6

Soap Test, Dr. Clark's Apparatus for 5 5 0

Skittle Pots, *see* Crucibles, (*page* 13.)

Specific Gravity Bottles, *see* Bottles, specific gravity, (*page* 10.)

Spirit Lamps, *see* Lamps, (*page* 25.)

		£	s.	d.
Spatulas, Bone	each, 6d. to	0	1	6
Ditto, Ivory	" 1s. 6d. to	0	3	0
Ditto, Steel	" 6d. to	0	1	6
Ditto, Platinum	" 10s to	1	1	0
Spoons, Wedgewood ware	from	0	1	0
" Berlin ware	"	0	2	0
" Platinum	1s. 6d. to	0	10	6
" Iron and Copper	from	0	0	3
Stirring Rods, Glass	2d., 3d., and 4d. each.			
Ditto, Meissen porcelain	5d. to 7d. "			
Ditto, Stoneware	8d. to 1s. 3d. "			

STILLS.

		£	s.	d.
Tin Still, one gallon, with worm tub, and lengthening pipe:— Common . £1 1s.,	Best make	1	5	0
Ditto, two gallons	"	1	15	0
Copper Still, one gallon, tin tub, and pewter worm,	best	2	0	0
Working Models of Stills, with lamp and tub, japanned, for table use	£1 10s., £2., and	2	10	0
Copper Stills, large, with pewter worm and wooden tub, with iron furnace, complete:— 2 gall., £4 14s., 3 gall., £5 5s., 4 gall., £6 6s., 6 gall., £8 10s.				
Stopcocks, Brass, for Gas, best make	each	0	3	0
Ditto, larger	4s. to	0	10	0
Ditto, Glass	from 5s to	0	8	0
Sulphuretted Hydrogen Gas Apparatus	" 2s. to	0	5	0
Sulphuric Acid Dish, for use with the Air Pump, porcelain		0	4	6
Supports for Funnels, *see* Funnel supports. (*page* 21.)				
Ditto, for Chemical Apparatus, with sliding stems,	each, 2s. to 5s.			
Syphons, Glass, bent tube	6d. to	0	1	6
Ditto, " with suction pipe at side	2s. and	0	3	0
Ditto, " with glass syringe	from	0	5	0
Ditto, Metal, with stopcock	"	0	7	0
Syringes, Glass, plain	"	0	1	0
Ditto, graduated	"	0	1	3
Ditto, Pocket condenser	each	0	3	0
German tinder for ditto	per oz.	0	1	0

Test Tubes, best flint glass:—

	s.	d.		s.	d.
4 in. long, per doz.	1	3	5 in. long, per doz.	1	9
4½ " "	1	6	6 " "	2	0

Ditto, German hard glass:—

	s.	d.		s.	d.
4 in. long, per doz.	1	6	5 in. long, per doz.	1	9
4½ " "	1	8	6 " "	2	0

Ditto, of large diameter, for boiling . each, 4d. and	0	0	6
Tests and re-agents, (*see page* 40.)			
Test Chests, various, (*see page* 15.)			
Test Tube Stands, mahogany, 6 holes . . . each	0	1	0
Ditto, " 12 " . . . "	0	1	4
Ditto, Racks, with holes and pegs, 6 holes . . "	0	1	8
Ditto, " 12 " . . "	0	2	3
Ditto, Holders . . . . "	0	0	6
Ditto, Cleaners . . . . "	0	0	6
Test Glasses, *see* Precipitating Jars, (*page* 29.)			
Test Jars, made of tube . . . . . from 4d. each.			
" Flasks " . . . . . " 4d. "			
" Papers, blue & red Litmus, Turmeric, &c., per sheet	0	0	1
" " in Books, each	0	0	2
" " Set of Books, assorted, in box	0	1	0

THERMOMETERS—FOR CHEMICAL PURPOSES.

Thermometer, with boxwood scale, graduated to 300·	0	3	6
Ditto, " " 400· 4s. to		6	6
Ditto, " with brass hinge, to allow of the bulb being immersed without soiling the scale, graduated to 400· Fahr., common, 6s. 6d., best,	0	12	0
Ditto, " 600· " 12s., "	0	14	0
Ditto, " best, with enamel tube, and metal scale, graduated to 400·	0	14	0
Ditto, " graduated to 600· . . .	0	16	0
Ditto, Glass, graduated on the stem, in wood case, 400·	0	12	0
Ditto, " " " 600·	0	15	0
Ditto, with paper scale, enclosed in glass tube, to 220·	0	6	0
Ditto, " " 300·	0	8	0
Ditto, with scale on white glass, enclosed in tube, best	0	18	0

FOR BREWING.

	£	s.	d.
Thermometer, 8 in. metal scale, in japanned tin case, ea.	0	3	6
" 10 " "	0	4	0
" 14 " " "	0	6	0
" 14 " enamel tube, best . . "	0	8	0
" 14 " " copper case, "	0	10	6
" 14 " " rivetted, very str.	0	15	0
Tongs for Crucibles, *(see page* 14.)			
Tobacco Pipe, brass, for blowing soap bubbles with the mixed gases	0	2	6
Toxicology, Apparatus for, *(see page* 37.)			
Trays of Meissen ware, for exposing substances to heat, in porcelain tubes . . . each, 4d. and	0	0	6
Tripod Stands, small, for Watch glasses . . each	0	1	6
Troughs, Pneumatic, *(see page* 29.)			
" Mercurial, *(see page* 27.)			
Tubes of Berlin porcelain . . . . from 2s. upwards.			
Ditto, of Wedgewood ware :—			
12 in. long, by 1 in. diameter, each 1s.			
15 " " 1 " " 1s. 3d.			
18 " " 1 " " 1s. 6d.			
Ditto, of Meissen ware, with rings at ends :—			
20 in. long, by ½ in. diameter, each 1s. 9d.			
20 " " ¾ " " 2s. 4d.			
20 " " 1 " " 2s. 10d.			
20 " " 1⅝ " " 3s. 9d.			
Tubing, of glass, *(see page* 23.)			
" India-rubber, *(see page* 11.)			
" Vulcanized ditto, *(see page* 24.)			
Tube Retorts . . . . each, 6d. and	0	0	8
Watch Glasses . . . . . . from 2d. to	0	0	6
" Holders . . . . each	0	0	6
Water Baths, Wedgewood ware, in one piece . . each	0	2	0
Ditto, Berlin ware, " "	0	2	6
Ditto, Wedgewood ware, in two pieces :—			
2½ oz. contents, each 1s. 2d. | 4 oz., 1s. 4d.			

Water Baths, Berlin ware, two pieces:— 3 oz. contents, each 2s. 6d. | 4 oz., 3s. 6d. | 5 oz., 5s.			
Ditto, Salt glaze stoneware, 3 oz capacity . .	0	1	3
Ditto, Copper, with inner Berlin dish, 4s. and	0	6	0
Ditto, " answering also for a Sand Bath .	0	8	6
Ditto, Oven for drying Precipitates, as recommended in Fresenius' Analysis	1	5	0
Water Test, Dr. Clark's Apparatus for	5	5	0
Washing Bottles, with cork and tubes . . 1s. to	0	2	0
Welter's Safety Tubes . . . . each	0	2	0
Weights of Brass and Platinum, *(see page* 5.)			
Wire gauze, Copper . . . . . . per sheet	0	1	0
Will and Varrentrap's Nitrogen Tube . . .	0	2	0
Woulfe's Bottles, *(see page* 10.)			
Ditto, in Trays, Sets of three, with tubes complete, 15s. &	1	1	0

URINOMETERS, & URINARY TEST CHESTS.

	£	s.	d.
Urinometers, in paper cases . . . . . . each	0	4	0
Ditto, with glass, and round exterior case . . "	0	8	6
Ditto, " square ditto . . . . . "	0	9	6
Ditto, with graduated glass and Thermometer . "	0	15	0
Ditto, with two small capped bottles for Acids, Spirit Lamp, Test tubes and Pipette, in portable flat leather case	1	10	0
Ditto, larger size	2	5	0
Ditto, in Metal, gilt, in paper case	0	15	0
Ditto, Glasses, plain	0	1	0
Ditto, " graduated	0	2	0
Ditto, Thermometers	0	4	6
Urinary Test Chests, containing an assortment of Apparatus and pure Chemicals for the Analysis of Urine, £2 12s. 6d. and	5	5	0

APPARATUS FOR ORGANIC ANALYSIS,

AS RECOMMENDED BY PROFESSORS LIEBIG, WILLS, MITSCHERLICH, ETC.

Combustion Tubes, hard German glass, 9d each, or 8s. per dozen.			
Ditto, plain per ℔.	0	3	0
Furnace for ditto, of sheet Iron, slight, with partitions	0	5	6
Ditto, " stouter material	0	8	6
Chloride of Calcium Tubes, straight, with bulb	0	0	8
Ditto, " bent	0	0	9
Potash Tube, Liebig's, five bulbs in case	0	3	0
Ditto, Mitscherlich's	0	3	6
Nitrogen Apparatus, Dr. Ure's, for determination of quantity, 4s.			
Ditto, Will and Varrentrap's	0	2	0
Connecting Tube, bent	0	1	9
Ditto, for drying Organic bodies	0	1	9
Three limb Tube, for adjusting Apparatus to Air Pump	0	1	6
Z Tube for ditto	0	0	9
U ditto	0	0	9
Gas conducting Tubes each, 9d. and	0	1	0
Suction Tubes each	0	0	9
Pipette, for passing Solutions into a Gas, over Mercury	0	0	9
Graduated Glass Cylinders, for collecting Gases, divided into 250 centimetres 10s 6d. and	0	15	0
Reduction Tubes, hard German glass, single bulb, bent or straight each	0	1	0
Ditto, double bulb "	0	1	3
Copper Foil, for wrapping round Combustion Tubes, per ℔.	0	3	0
Oxide of Copper per ℔. 5s. 6d., per oz.	0	0	6
Crucible Tongs, for use with Furnace 1s. 6d. to	0	3	6
Bulb Tube, for weighing the Oxide of Copper	0	0	8
Exhausting Syringe to attach to table, with connections for Apparatus £1 8s. to	2	10	0
Mercurial Troughs, of Berlin or Wedgwood ware, (*see page* 27.)			
Ditto, tall, Glass, and very stout	0	4	0
Connections, India-rubber 2d. each, 1s. 6d. per dozen			
Mortars and Pestles, Meissen porcelain, for mixing substances for Organic Analysis, 2s., 2s. 6d., 3s., and 4s.			

TOXICOLOGICAL APPARATUS.

	£	s.	d.
Professor Clark's Apparatus for Testing Arsenic . .	0	10	0
Marsh's Apparatus, with bent tube and stop-cock, on stand :— Plain tube, 8s. 6d., single bulb, 9s. 6d., double bulb, 10s. 6d.			
Or tubes only, " 1s. 6d., " 2s., " 2s. 6d.			
Fresenius' Apparatus for detection of Arsenic . each	0	4	0
Ditto, Tubes for ditto . . . . "	0	0	6
Dr. Thompson's Modification of Marsh's Apparatus	0	10	6
Marton's Galvano-Arsenical Apparatus . . .	1	10	0
Christison's Apparatus, as described in his work on "Poisons," in sets . . . from	1	0	0
Apparatus for Reinsch's Test for Arsenic, complete	0	15	0
Pure Copper for ditto . . . per oz.	0	0	4
Gas Generator, with Purifier, for Sulphuretted Hydrogen Gas	0	3	6
Arsenic Tubes, of different sizes and shapes, per dozen, from 1s. 6d. to	0	4	0
Set of 15 assorted ditto, in box	0	2	0
Small Funnels, for introducing substances into Arsenic Tubes . . . . . each	0	0	4
Pure Zinc, for generating Hydrogen Gas . per oz.	0	0	3
Toxicological Chests, containing a selection of Apparatus and pure Chemicals for the detection of Poisons, £2 2s. and	3	3	0
Ditto, containing a larger assortment of Tests & Apparatus, £5 5s. and	10	10	0

AGRICULTURAL CHEMISTRY.

As the value of land depends entirely on its capability for growing certain plants, it would be highly beneficial to the farmer or landed proprietor to become acquainted with the composition of the soil with which he has to deal, in order that manure can be so applied without entailing waste, to render the land productive, and capable of growing any particular kind of grain desired.

The following list contains a description of the Apparatus, &c., required for the investigation of the subject, the analysis of soils, manures, plants, &c.

		£	s.	d.
Balance, with decimal weights, and Apparatus for specific gravity	£3 3s., £7 7s., and	15	15	0
Specific Gravity Bottle and counterpoise, in case:—	1000 grains, 8s. 6d 500 grains, 7s. 6d.			
Lamps, Argand, Oil	7s. 6d. and	0	8	6
Ditto, Spirit, glass	1s. 6d. to	0	5	0
Sand Bath and drying oven	15s. and	1	5	0
Water Baths	3s. 6d. to	0	7	6
Ditto, Tin, as described in Fresenius' Analysis		0	8	6
Oil Bath	" "	1	15	0
Hot Air Stove		0	17	6
Sieves of Tin, with wire gauze bottoms		0	3	6
Ditto, Set of three, of different degrees of fineness		0	7	6
Beaker Glasses, in sets	from 2s. 6d. to	0	8	0
Flasks, various	" 3d. to	0	1	0
Precipitating Glasses	each, from	0	0	9
Test Glasses, on feet	"	0	0	8
Mortars and Pestles, Iron, Wedgewood, Berlin, or Agate,	(*see page* 27.)			
Spatulas, Steel	from 6d. to	0	1	6
Ditto, Ivory	" 1s. 6d. "	0	3	0
Crucibles; Hessian, English, Berlin, Platinum, &c.,	(*see pages* 12—14.)			
Crucible Tongs, (*see page* 14.)				
Stirring Rods	each, 2d., 3d., and	0	0	4
Sulphuretted Hydrogen Gas Apparatus, with Purifier,	2s. 6d. and	0	3	6
Test Tubes	per doz., 1s. 6d., 2s., 2s. 6d., and	0	3	6

		£	s.	d.
Test Tube Stands	each, 1s., 1s. 6d., and	0	2	6
Funnels, Glass, ribbed	from 4d. to	0	1	0
Filter Paper, fine	per quire	0	1	3
Ditto, coarse	per ℔.	0	1	2
Retort Stands	from 3s. 6d. to	0	10	0
Evaporating Dishes, Wedgewood, *(see page* 17.)				
Ditto, Berlin and Meissen, *(see page* 18.)				
Test Papers	per sheet, 1d., per book	0	0	2
Ditto, Box of, containing assortment		0	1	0
Glass Tube, German glass, for ignition	per ℔.	0	3	0
Retorts and Receivers, *(see pages* 30, 31.)				
Carbonic Acid Gas Apparatus, for testing the amount of Carbonic Acid in Calcareous soils		0	2	6
Blowpipes, *(see page* 7.)				
Platinum Wire and Foil, *(see page* 29.)				
Ditto, Forceps	from 2s. 6d. to	0	15	0
Sets of Apparatus, with Chemicals complete, for the analysis of soils, including Balance,	from £10 10s. to	20	0	0
Smaller Sets, without Balance	from £4 to	7	0	0

APPARATUS USED IN THE ASSAY OF METALS.

		£	s.	d.
Portable Iron Furnace, lined with fireclay, &c., for reducing metallic ores, distilling, and cupellation		4	0	0
Blast Furnaces	from £1 4s. to	2	15	0
Bellows, for use with ditto, to keep up continued blast,	£1 10s. and	2	2	0
Crucibles, best London make,	from per doz. 6d. to	0	3	6
Ditto, Black Lead	" 1s. 6d. "	0	15	0
Crucible Tongs	each, 1s. 6d. "	0	4	6
Cupels	from per doz. 8d. "	0	2	6
Cupel Tongs	each, 2s. 6d. "	0	4	6
" Moulds	" 4s. 6d. "	0	15	0
" Trays	each	0	5	6
Anvils	each, 15s. and	1	0	0
Assay Scoops, with handles	each	0	7	6
Muffles, for use with Portable Iron Furnace, from per doz.,	8s. to	1	0	0

		£	s.	d.
Mortars and Pestles, Iron	from 1s. 6d. to	0	10	0
Ditto, hard Steel, for crushing small quantities of minerals	each	0	14	0
Ditto, Wedgowood & Berlin ware, *(see pages* 27, 28.)				
Blowpipes	from each 1s. to	0	7	6
Balances, *(see page* 4.)				
Flatting Mill, hard Steel		4	10	0
Ingot Moulds	from 1s. 3d. to	0	5	0
Sieves, Copper wire, three in set		0	7	6
Ditto, Hair	from 2s. to	0	10	0
Shears for cutting metal	“ 3s. “	0	5	0
Pliers	“ 2s. “	0	4	6
Hammers, various weights	“ 2s. 6d. “	1	0	0

CHEMICALS.

Acid, Acetic, glacial, for Photography, &c paper process,	per oz.	0	1	0
“ “ “ crystallizable, for glass	“	0	0	8
“ “ best, 80 per cent.	per ℔.	0	2	0
“ “ Distilled Vinegar	“	0	1	0
“ Arsenic	per oz.	0	1	0
“ Arsenious, pure lump	“	0	0	6
“ “ common, powdered	per ℔.	0	1	0
“ Benzoic	per oz.	0	2	0
“ Boracic, common	per ℔.	0	1	6
“ “ pure	per oz.	0	0	6
“ “ “ fused	“	0	1	6
“ Bromic	“	0	10	0
“ Camphoric	“	0	5	0
“ Carbazotic	“	0	8	0
“ Chromic, solution, pure	“	0	3	0
“ “ crystals	“	0	2	0
“ “ “ pure	“	0	10	0
“ Chloric, solution	“	0	5	0
“ Per-chloric	“	0	15	0
“ Citric, common	“	0	0	4

		£	s.	d.
ACID, Fluo Boric	per oz.	0	2	6
“ Fluo Silicic.	“	0	0	3
“ Formic, solution	“	0	0	6
“ Gallic	per ℔. 24s. “	0	2	0
“ Hydriodic	“	0	4	0
“ Hydro-bromic	“	0	5	0
“ Hydro-chloric, common	per ℔.	0	0	3
“ “ pure	“	0	1	0
“ Hydrocyanic, Scheele's	per oz.	0	0	6
“ Hydrofluoric.	per ℔. 3s “	0	0	4
“ Hydro-sulphuric	“ 1s. “	0	0	2
“ Iodic, crystals	“	0	5	0
“ “ solution	“	0	0	3
“ Lactic, solution	“	0	3	0
“ Lithic	“	0	3	0
“ Malic, solution	“	0	5	0
“ Molybdic	“	0	5	0
“ Nitric, sp. g. 1400·com.	per ℔.	0	1	0
“ “ “ pure	“	0	1	6
“ “ “ 1500· “	“	0	2	6
“ Nitro-Muriatic	“	0	1	0
“ Nitrous	“	0	1	0
“ Oxalic, common	“	0	1	9
“ “ pure	per oz.	0	0	3
“ Phosphoric, P.L., sol	“	0	0	3
“ “ glacial	“	0	1	6
“ “ Anhydrous.	“	0	4	0
“ Pyro-Gallic, pure	per dr. 2s. 6d. “	0	18	0
“ Succinic	“	0	5	0
“ Sulphuric	per ℔.	0	0	3
“ “ pure	1s. 6d. &	0	2	0
“ “ Nordhausen	“	0	1	6
“ “ glacial	per oz.	0	2	0
“ Sulphurous, very strong	per ℔.	0	1	0
“ Tannic	per oz.	0	1	6
“ Tartaric powdered, (variable)	per ℔.	0	2	0

		£	s.	d.
Acid, Tartaric, crystal, (variable)	per ℔.	0	2	0
“ “ “ pure “	per oz.	0	0	6
“ Titanic	“	0	10	0
“ Tungstic, com.	per ℔.	0	4	0
“ “ pure	per oz.	0	2	0
“ Uric	“	0	3	0
“ Valerianic	“	0	5	0
“ Vanadic	per gr.	0	0	6
Aconitine	“	0	0	6
Alloy, fusible	per ℔.	0	5	6
Alum, common, lump	“	0	0	3
“ pure	per oz.	0	0	3
Alumina	“	0	1	0
“ Acetate, common	per ℔.	0	1	0
“ “ pure	per oz.	0	2	0
“ Hydrochlorate	“	0	2	0
“ Nitrate	“	0	2	0
“ Oxalate	“	0	2	6
“ Sulphate, common	per ℔.	0	0	8
“ “ pure	per oz.	0	2	0
“ Silicate	“	0	2	0
Amalgam, for Electrical purposes	“	0	0	8
Amber	“	0	1	0
“ solution of, in Chloroform	“	0	1	0
Ammonia, solution, conc. ·880	per ℔.	0	1	4
“ “ “ ·960	“	0	0	10
“ Acetate, sol. conc.	per oz.	0	0	2
“ Arsenite, sol.	“	0	0	6
“ Arseniate	“	0	1	0
“ Benzoate, common	“	0	2	6
“ “ pure	“	0	4	0
“ Borate, common	per ℔.	0	4	0
“ “ pure	per oz.	0	1	0
“ Carbonate	per ℔.	0	1	0
“ “ pure . per oz. 2d.,	“	0	2	0
“ Bicarbonate	per oz.	0	0	6

				£	s.	d.
AMMONIA,	Bichromate		per oz.	0	4	0
"	Fluate		"	0	2	0
"	Hydrosulphate	per ℔. 3s. 8d.,	"	0	0	3
"	Iodide, (variable)		"	0	4	0
"	Muriate, common		per ℔.	0	0	8
"	" purif.		per oz.	0	0	3
"	" pure, crystallized		"	0	0	6
"	Nitrate, fused		per ℔.	0	4	0
"	" crystals		"	0	3	6
"	Oxalate, purified		per oz.	0	0	6
"	" pure		"	0	0	8
"	Phosphate		"	0	0	6
"	" pure		"	0	1	0
"	Succinate		"	0	4	0
"	Sulphate, common		per lb.	0	0	4
"	" crystallized		"	0	0	9
"	" pure		per oz.	0	0	3
"	Sulphite		"	0	1	0
"	Tartrate		"	0	0	4
"	" pure		"	0	1	0
"	Tungstate		"	0	7	0
"	Urate		"	0	0	8
ALMOND POWDER, for lute			per lb.	0	1	6
AMYGDALINE			per oz.	0	12	0
ANTIMONY			per lb.	0	1	6
"	Glass of		per oz.	0	0	3
"	Sesquichloride		"	0	5	0
"	Iodide, (variable)		"	0	4	0
"	Muriate	per lb. 1s. 6d.,	"	0	0	2
"	Sesquioxide, pure		"	0	1	0
"	Deutoxide		"	0	1	0
"	Peroxide		"	0	1	0
"	Sulphuret, lump		per lb.	0	0	9
"	" powdered		"	0	1	0
"	" precipitated		per oz.	0	0	6
"	Tartarized		"	0	0	6

		£	s.	d.
Argol	per lb.	0	1	0
Arsenic, Metallic . . . per oz. 6d.,	“	0	2	6
“ Iodide, (variable)	per oz.	0	4	0
“ Proto-sulphuret, Realgar, lump .	per lb.	0	1	0
“ “ “ powdered	“	0	2	0
“ Sesqui-sulphuret, Orpiment, lump .	“	0	1	0
“ “ “ powdered	“	0	2	0
Asbestos	per oz.	0	1	0
Barium, Bromide	“	0	4	6
“ Chloride, common	per lb.	0	1	6
“ “ pure	4d. &	0	0	6
“ “ fused	per oz.	0	1	0
“ Iodide, crystals, (variable) . .	“	0	4	0
“ Peroxide	“	0	4	0
“ Sulphuret, common	“	0	0	4
“ “ pure	“	0	1	0
Baryta, pure, Caustic	“	0	1	6
“ “ crystals	“	0	1	0
“ common	“	0	0	8
“ solution	“	0	0	2
“ Acetate	“	0	0	6
“ “ pure	“	0	1	0
“ Bromate	per drm.	0	3	0
“ Carbonate, native	per lb.	0	0	4
“ “ pure	per oz.	0	0	6
“ Chlorate	“	0	2	0
“ Chromate	“	0	1	0
“ Hyposulphate	“	0	7	6
“ Hyposulphite	“	0	7	6
“ Hypophosphite	“	0	7	6
“ Iodate	“	0	8	0
“ Nitrate, common	per lb	0	1	6
“ “ pure	per oz.	0	0	6
“ Sulphate, common, native . . .	per lb.	0	0	4
“ “ purified	“	0	1	0
“ “ pure	per oz.	0	0	4

			£	s.	d.
BARYTA, Tartrate		per oz.	0	1	0
BISMUTH, (variable)		per lb.	0	4	6
“ Iodide “		per oz.	0	3	6
“ Nitrate, cryst.		“	0	1	0
“ Trisnitrate		“	0	0	6
“ Oxide		“	0	0	6
“ Peroxide		“	0	1	6
BONE ASH, for Cupels	per cwt. 36s.,	per lb.	0	0	6
BORAX, refined		“	0	1	6
“ glass of		per oz.	0	0	6
BRAZIL WOOD, Tincture		“	0	0	4
BROMINE, (variable)		“	0	3	0
“ Chloride of		“	0	3	0
CADMIUM, in stick		“	0	2	6
“ filed		“	0	3	0
“ Carbonate		“	0	2	6
“ Chloride		“	0	2	6
“ Nitrate		“	0	2	6
“ “ solution		“	0	0	3
“ Oxide		“	0	2	6
“ Sulphate		“	0	2	6
“ Sulphuret		“	0	3	0
CALCIUM, Chloride, solution		per lb.	0	0	3
“ “ for Organic Analysis		“	0	2	6
“ “ pure		per oz.	0	0	4
“ Phosphuret		“	0	1	0
“ Sulphuret, common		“	0	0	6
“ “ pure		“	0	1	6
CAOUTCHOUCINE		“	0	0	6
CAOUTCHOUC, Varnish		per lb.	0	3	0
“ Sheet		each	0	1	0
CARBON, Bisulphuret	per lb. 3s. 6d.,	per oz.	0	0	6
“ Ter-chloride		“	0	1	0
“ Iodide		“	0	15	0
CARMINE, common		“	0	6	6
“ pure		“	0	8	0

		£	s.	d.
Cerium, Acetate	per oz.	0	12	0
“ Carbonate	“	0	12	0
“ Oxalate	“	0	12	0
“ Oxide	“	0	14	0
“ Sulphate	“	0	14	0
Chameleon, Mineral	“	0	0	6
Charcoal, Animal, common	per lb.	0	0	6
“ “ nearly pure	per oz.	0	0	6
“ “ quite pure	“	0	1	0
Chloroform	per lb. 8s., “	0	0	8
Chlorine, solution	“ 1s., “	0	0	2
Chromium, Metallic	“	0	12	0
“ Carbonate	“	0	1	0
“ Chloride	“	0	1	0
“ Oxalate and Ammonia	“	0	1	6
“ “ Potash	“	0	1	6
“ “ Soda	“	0	1	6
“ Oxide	“	0	1	0
“ “ common	per lb.	0	4	6
“ Sulphate, solution	per oz.	0	0	6
“ “ and Potash	“	0	1	0
Clay, China, Kaolin	per lb.	0	0	2
“ Stourbridge	“	0	0	2
Cobalt, Metal, pure	per oz.	0	8	0
“ Acetate, crystals	“	0	10	0
“ “ solution	“	0	1	0
“ Arseniate	“	0	5	0
“ “ pure	“	0	15	0
“ Carbonate	“	0	5	0
“ “ pure	“	0	8	0
“ Chloride	“	0	6	0
“ “ solution	“	0	1	0
“ Chromate	“	0	10	0
“ Nitrate, crystals	“	0	6	0
“ “ solution, common	“	0	1	0
“ “ “ pure	“	0	1	6

		£	s.	d.
Cobalt, Oxalate	per oz.	0	10	0
“ Phosphate	“	0	8	0
“ Protoxide, pure	“	0	6	0
“ Peroxide	“	0	4	0
“ “ quite pure	“	0	10	0
“ Sulphate, crystals	“	0	10	0
“ “ solution	“	0	1	0
Collodion, plain	“	0	0	8
“ Iodized	“	0	0	9
Columbium, Oxide	per grain	0	0	4
Copper, Foil	per oz.	0	0	3
“ Leaf	per book	0	0	3
“ Turnings	per lb.	0	1	6
“ Acetate, (Verdigris)	per lb. 2s. 6d., per oz.	0	0	3
“ “ crystals	“	0	0	8
“ Ammoniated	“	0	0	6
“ Arseniate	“	0	1	0
“ Arsenite	“	0	1	0
“ Carbonate	“	0	0	6
“ Chloride, crystals	per lb. 2s. 6d. &	0	5	0
“ “ pure	per oz.	0	0	9
“ Chromate	“	0	2	0
“ Cyanide	“	0	1	0
“ “ and Potassium	“	0	1	6
“ Diniodide	“	0	2	6
“ Ferrocyanide	“	0	1	0
“ Nitrate, common	per lb. 2s. 6d., “	0	0	3
“ “ pure	“ 4s., “	0	0	6
“ Protoxide	“	0	2	0
“ “ Hydrated	“	0	1	6
“ Black Oxide, for Organic Analysis, per lb. 5s. 6d. & oz. 6d.				
“ “ perfectly pure	per oz.	0	0	8
“ Sulphate, common	per lb.	0	0	8
“ “ pure	per oz.	0	0	3
“ Sulphuret	“	0	0	4
Dextrine	per lb	0	1	0

		£	s.	d.
DISTILLED WATER, pure	per gallon	0	0	8
ÆTHER, Acetic	per oz	0	1	0
“ Hydrochloric	“	0	1	0
“ Nitric	“	0	1	0
“ Pyroligneous	per pint	0	1	6
“ Sulphuric, rect. ·750	per oz.	0	0	6
“ “ “ ·720	“	0	0	8
“ “ washed	“	0	1	0
FELSPAR	per lb.	0	0	6
FLUX, black	per oz.	0	0	4
“ white	“	0	0	4
FLUOR SPAR, lump	per lb.	0	0	4
“ powdered	“	0	0	6
FUSIBLE METAL	“	0	5	6
GALLS, Tincture	per oz.	0	0	4
GLYCERINE, common	per lb. 8s., “	0	0	4
“ pure	“	0	1	3
GLUCINA	per drm.	0	5	0
“ Carbonate	“	0	5	0
GOLD, Leaf	per book	0	1	9
“ Chloride, crystals	per drm.	0	10	0
“ “ in bottles, 15 grains each		0	3	0
“ “ solution	per oz. 2s. 6d. &	0	5	0
“ “ and Sodium	per drm.	0	10	0
“ Cyanide	“	1	0	0
“ “ of Potassium, solution	per oz.	0	5	0
“ Hyposulphite, (Sel d'or)	per bottle	0	4	6
“ Iodide, (variable)	per drm.	0	18	0
“ Oxide	“	0	18	0
“ Sulphuret	“	0	18	0
INDIGO, common	per oz.	0	0	6
“ best	“	0	1	0
“ Sulphate	“	0	0	6
IODINE, (variable) common	“	0	2	0
“ “ resublimed	“	0	2	6
“ Bromide solution	“	0	1	0

		£	s.	d.
Iodine, Chloride	per oz.	0	8	6
" Tincture	"	0	0	6
Iron, Filings	per lb.	0	0	6
" Turnings	"	0	0	6
" Acetate of Protoxide	per oz	0	0	6
" " Peroxide	"	0	0	6
" Ammonio Muriate	"	0	0	6
" Arseniate	"	0	1	0
" Bromide, (variable)	"	0	4	0
" Carbonate	per lb. 1s. 6d., "	0	0	2
" " Saccharine	"	0	0	6
" Chromite, (Chrome ore)	per lb.	0	0	9
" Citrates	per oz.	0	0	6
" Citrate and Quinine, (variable)	"	0	4	0
" Cyanuret, Sesqui Ferro Cyanuret	"	0	0	6
" " " Ferrid Cyanuret	"	0	1	0
" Iodide, (variable)	"	0	2	0
" Lactate	"	0	3	0
" Proto-nitrate	"	0	0	4
" Per-nitrate	"	0	0	3
" Oxalate	"	0	1	0
" Oxide, Magnetic	"	0	0	6
" " Peroxide	"	0	0	6
" " " Hydrated	"	0	0	6
" Per-muriate, solution, strong	"	0	0	4
" Proto-phosphate	"	0	1	0
" Sesqui-phosphate	"	0	1	0
" Sulphate, Proto, crystals	per lb. 1s., "	0	0	2
" " Per, solution	"	0	0	3
" " " dry	"	0	0	9
" Sulphuret	per lb. 8d. and	0	1	0
" Tartrate and Ammonia	per oz.	0	1	0
" " Potash	"	0	0	6
Jalapine	"	0	8	0
Kreosote, English	"	0	0	9
" German, pure	"	0	1	6

		£	s.	d.
LEAD, pure, for cupellation	per lb.	0	1	6
" Acetate, common	"	0	0	9
" " pure	per lb. 2s. 6d., per oz.	0	0	3
" Diacet. solution	" 1s., "	0	0	2
" Carbonate, common	" 1s., "	0	0	2
" " pure	"	0	0	3
" Chloride	"	0	0	6
" Chromate	"	0	0	4
" " fused, for Organic Analysis	"	0	0	4
" Chrome yellow	per lb. 1s. 6d. to	0	4	0
" Dichromate	per oz.	0	0	6
" Ferro-cyanide	"	0	0	8
" Fluoride	"	0	0	6
" Iodide, (variable)	"	0	2	0
" Nitrate, common	per lb.	0	1	0
" " pure	per oz.	0	0	4
" Dinitrate	"	0	0	6
" Trisnitrate	"	0	0	4
" Oxalate	"	0	0	6
" Oxide, Protoxide, Litharge, powdered,	per lb.	0	0	6
" " " " Hydrate	per oz.	0	0	6
" Deutoxide, Minium	per lb.	0	0	6
" Peroxide	per oz.	0	1	0
" Phosphate	"	0	1	0
" Sulphate, common	per lb.	0	2	0
" " pure	per oz.	0	0	3
" Tartrate, common	"	0	0	3
" " pure	"	0	0	6
" Sulphuret, precipitated	"	0	0	9
LIME, pure caustic	"	0	1	0
" Acetate, common	"	0	0	2
" " pure	"	0	0	6
" Carbonate, white, marble	per lb.	0	0	6
" " pure	per oz.	0	0	4
" Chloride, (Bleaching Powder)	per lb.	0	0	8
" Hydrosulphate	per oz.	0	0	3

		£	s.	d.
Lime, Hydrochlorate	per oz.	0	0	3
“ Nitrate, common	“	0	0	4
“ “ pure	“	0	0	6
“ Oxalate	“	0	0	6
“ Phosphate	“	0	0	6
“ Phosphuret	“	0	1	0
“ Sulphate, common	per lb.	0	0	3
“ “ pure	per oz.	0	0	6
“ Sulphite	“	0	0	6
“ Hyposulphite	“	0	0	6
“ Tartrate	“	0	0	6
“ Tungstate	“	0	2	0
Lithia	per drm.	0	4	0
“ Acetate	“	0	4	0
“ Carbonate	“	0	4	0
“ Sulphate	“	0	4	0
Litmus	per oz.	0	0	6
“ Paper	per sheet	0	0	1
“ “	per book	0	0	2
“ Tincture	per oz.	0	0	4
Lupuline	“	0	3	0
Lycopodium . . . . per lb 4s. 6d.,	“	0	0	6
Magnesia, Calcined	“	0	0	4
“ Acetate	“	0	1	0
“ Carbonate	“	0	0	4
“ Muriate	“	0	0	6
“ Nitrate	“	0	1	0
“ Oxalate	“	0	1	0
“ Sulphate	per lb.	0	0	4
“ “ pure	“	0	1	6
Magnesium, Chloride, (Anhydrous)	per drm.	0	2	0
“ “ Hydrated	per oz.	0	0	6
Manganese, Metallic	“	0	12	0
“ Peroxide, lump	per lb.	0	0	3
“ “ powder	“	0	0	3
“ “ pure	per oz.	0	1	0

		£	s.	d.
MANGANESE, Protoxide, pure	per oz.	0	2	0
“ Sesquioxide “	“	0	2	0
“ Acetate	“	0	2	0
“ Carbonate, common	per lb.	0	3	0
“ “ pure	per oz.	0	1	0
“ Muriate, pure	“	0	1	0
“ Oxalate	“	0	1	0
“ Sulphate	“	0	0	6
“ “ common	“	0	0	3
MERCURY, (variable)	per lb.	0	3	6
“ “ distilled	“	0	4	6
“ Acetate of Protoxide	per oz.	0	2	0
“ “ Peroxide	“	0	2	0
“ Bromide	“	0	5	0
“ Chloride	“	0	0	6
“ Bichloride	“	0	0	6
“ Ammonio-Chloride	“	0	0	6
“ Cyanide	“	0	2	0
“ Bicyanide	“	0	1	0
“ Chromate	“	0	1	0
“ Protoiodide, (variable)	“	0	3	0
“ Periodide “	“	0	3	0
“ Protonitrate	“	0	1	0
“ Sesquinitrate	“	0	0	9
“ Pernitrate, solid	“	0	1	0
“ Protoxide	“	0	1	0
“ Peroxide	“	0	1	0
“ “ Nitric	“	0	0	6
“ Phosphate	“	0	1	0
“ Protosulphate	“	0	1	0
“ Persulphate	“	0	1	0
“ Protosulphuret	“	0	0	3
“ Persulphuret	“	0	0	6
MICROCOSMIC SALT	“	0	0	6
MOLYBDENUM, Metallic	“	0	15	0
“ Oxide	“	0	5	0

		£	s.	d.
Molybdenum, Sulphuret, native	per oz.	0	1	6
Morphia, (variable)	“	0	15	0
“ “ Acetate	“	0	12	6
“ “ Muriate	“	0	12	6
“ “ Nitrate	“	0	12	6
“ “ Sulphate	“	0	12	6
Naphtha, Mineral, rectified	“	0	1	0
“ Wood, for burning	per pint	0	1	6
“ “ pure	per oz.	0	0	6
“ Coal	per pint	0	1	0
Naphthaline	per oz.	0	2	0
Narcotine	“	0	15	0
“ Muriate	“	0	14	0
Nickel, common	“	0	0	6
“ purified	“	0	1	6
“ pure	“	0	2	6
“ Acetate, solution	“	0	1	0
“ “ crystals	“	0	4	6
“ Carbonate	“	0	1	0
“ Chloride, solution	“	0	0	6
“ “ crystals	“	0	3	0
“ Oxide	“	0	1	6
“ “ Hydrated	“	0	2	0
“ Oxalate	“	0	2	6
“ Sulphate, crystals	“	0	1	6
“ “ solution	“	0	0	6
“ Sulphate and Potash	“	0	1	6
Osmium	per grain	0	1	0
“ Oxide, solution	per oz.	0	10	0
Palladium, pure	“	1	10	0
“ precipitated	“	1	16	0
“ Sponge	“	1	0	0
“ Oxide	“	1	0	0
“ Nitrate, solution	“	0	5	0
“ Chloride “	“	0	5	0
Phosphorus	“	0	0	6

		£	s.	d.
PHOSPHORUS, solution, in Æther	per oz.	0	1	0
" " Oil	"	0	0	6
" " Bisulphuret Carbon.	"	0	1	6
PLATINUM, (variable) Ore	"	1	10	0
" " Sponge	"	1	10	0
" wire and sheet, thick	"	1	7	6
" wire and foil, thin	"	1	10	0
" Capsules and Crucibles	"	1	10	0
" Black	per drm.	0	5	0
" Chloride	"	0	5	0
" " solution	per oz.	0	2	0
" Proto-chloride	per drm.	0	5	0
" Ammonio-chloride	"	0	3	0
" Potassio chloride	"	0	3	0
" Sodio-chloride	"	0	3	0
" Iodide	"	0	5	0
" Nitrate, solution	per oz.	0	5	0
" Oxide	per drm.	0	5	6
" Per-sulphate, solution	per oz.	0	5	0
PLATINIZED SILVER	per oz. 10s. and	0	11	0
PLUMBAGO, best	per oz.	0	0	6
POTASSA, fused	per lb. 3s. 6d., "	0	0	3
" solution, Liquor Potassæ	per lb.	0	1	0
" pure, solid	per oz	0	0	9
" " by Alcohol	"	0	1	0
" Acetate	"	0	0	6
" Antimoniate	"	0	1	0
" Antimonite	"	0	1	6
" Arsenite	"	0	1	0
" Arseniate	"	0	1	0
" Bin-arseniate	"	0	0	6
" Borate	"	0	1	0
" Bromate	"	0	5	0
" Carbonate, common	per lb. 9d., "	0	0	1
" " pure	"	0	0	6
" " fused	"	0	1	0

			£	s.	d.
Potassa,	Bicarbonate, common	per lb. 2s., per oz.	0	0	2
“	“ pure	“	0	0	6
“	Chlorate	per lb. 2s. 6d., “	0	0	3
“	Chromate, common	“	0	0	3
“	“ pure	“	0	0	6
“	Bichromate, common	per lb. 1s. 6d. “	0	0	2
“	“ pure	“	0	0	4
“	Citrate	“	0	1	0
“	Formiate	“	0	5	0
“	Hydrosulphate	“	0	0	6
“	Manganate	“	0	1	0
“	Per Manganate	“	0	5	0
“	Nitrate, common	per lb.	0	0	8
“	“ pure	per lb. 1s.6d., per oz.	0	0	2
“	Oxalate, neutral	“ 3s.6d., “	0	0	4
“	Bin-oxalate	“	0	0	4
“	Silicate, very soluble	“	0	0	6
“	Super-silicate, slightly soluble	per lb.	0	1	0
“	Sulphate	per lb. 1s., per oz.	0	0	2
“	Bisulphate	“ 1s. 6d., “	0	0	2
“	“ pure	“ 2s. 6d., “	0	0	3
“	Sulphite	“	0	1	0
“	“ solution	per lb.	0	2	0
“	Hyposulphite	“	0	4	0
“	Tartrate	per oz.	0	0	3
“	“ and Iron	“	0	0	6
“	“ and Soda	“	0	0	3
“	Bitartrate	per lb. 1s. 6d., “	0	0	2
“	Tungstate	“	0	5	0
Potassium		per drm. 4s, per gr.	0	0	1
“	6 grs. in sealed tube		0	1	0
“	Argento-cyanide, sol., strong		0	1	0
“	Auro-cyanide “		0	5	0
“	Bromide	per oz.	0	3	0
“	Chloride	“	0	0	3
“	Cyanuret	“	0	0	6

		£	s.	d.
Potassium, Cyanuret, fused	per lb.	0	6	0
“ “ pure crystals	per oz.	0	2	0
“ Ferro-cyanuret	per lb. 3s. “	0	0	3
“ “ pure	“	0	0	6
“ Ferro-sesqui-cyanuret (Red Prussiate)	“	0	0	6
“ Fluoride	“	0	1	0
“ Iodide, (variable)	“	0	2	0
“ Silico-fluoride	“	0	2	0
“ Sulpho-cyanide, crystal	“	0	1	6
“ “ solution	“	0	0	3
“ Sulphuret	per lb. 2s. “	0	0	2
“ “ pure	“	0	0	6
Prussian Blue	“	0	0	6
Rhodium	per gr.	0	0	6
Rouge, fine	per lb. 3s. 6d., per oz.	0	0	4
Selenium	per gr.	0	0	4
Silica, hard	per lb. 2s., per oz.	0	0	3
“ pure light	“	0	1	0
Silver, Foil	“	0	8	6
“ Wire	“	0	8	6
“ Capsules and Crucibles	“	0	10	6
“ Precipitated	“	0	8	0
“ Platinized	10s. and	0	11	0
“ Acetate	“	0	8	0
“ “ crystals	“	0	12	0
“ Chloride	“	0	7	0
“ Cyanide	“	0	7	0
“ Iodide, (variable)	“	0	7	0
“ Leaf	per book	0	1	6
“ Nitrate, crystals	per oz.	0	5	0
“ “ fused, in pipes	“	0	5	0
“ “ solution	“	0	1	0
“ Oxide	“	0	7	6
“ Sulphate	“	0	7	6
“ “ crystals	“	0	9	0
“ Sulphuret	“	0	8	0

			£	s.	d.
SILVER, Phosphate		per oz.	0	8	0
SODA, Pure		"	0	0	8
" " by Alcohol		"	0	1	0
" Solution, sp. g. 1·270		per lb.	0	2	0
" Acetate, common	per lb 2s.	per oz.	0	0	2
" " pure		"	0	0	6
" Arseniate		"	0	0	6
" Binarseniate		"	0	0	6
" Arsenite		"	0	1	0
" Benzoate, common		"	0	2	6
" ditto, pure		"	0	4	0
" Biborate	per lb. 1s. 6d.	"	0	0	2
" Carbonate, common		per lb.	0	0	6
" " pure crystallised		per oz.	0	0	4
" " fused		"	0	0	6
" Bicarb.		per lb.	0	1	0
" " pure		per oz.	0	0	2
" Chloride, sol. (chlorite)		per lb.	0	1	0
" Hyposulphite	per lb. 1s. 6d.	per oz.	0	0	2
" Nitrate, re-crystallized		"	0	0	3
" " pure		"	0	0	6
" Oxalate, neutral		"	0	0	6
" Binoxalate		"	0	0	6
" Phosphate, common		"	0	0	2
" " pure		"	0	0	6
" Biphosphate		"	0	2	0
" Phosphate and Ammonia		"	0	0	6
" Succinate		"	0	3	6
" Sulphate, re-crystallized		per lb.	0	0	6
" " pure		per oz.	0	0	3
" Sulphite		"	0	0	6
" Tungstate		"	0	5	0
SODIUM	per dram, 4s.	per grain	0	0	1
" Six grains in sealed tube			0	1	0
" Chloride, pure		per oz.	0	0	3
" Fluoride		"	0	1	6

			£	s.	d.
Sodium, Sulphuret, common		per oz.	0	0	6
" " pure		"	0	0	8
Strontia, pure caustic		"	0	2	0
" " crystals		"	0	1	6
" Acetate		"	0	1	0
" Carbonate, pure		"	0	0	6
" Muriate, common	per lb 2s.	"	0	0	3
" " pure		"	0	0	6
" Nitrate, common		per lb.	0	1	0
" " pure		per oz.	0	0	4
" Sulphate, native		per lb.	0	0	4
" " pure		per oz	0	0	6
Strontium, Chloride, fused		„	0	1	0
" Sulphuret, pure		"	0	1	0
Sugar of Milk	per lb. 2s.	"	0	0	4
Sulphur Roll		per lb.	0	0	3
" Sublimed		"	0	0	4
" Precipitated		per oz.	0	0	2
" Chloride		"	0	2	6
" Iodide (variable)		"	0	2	6
Sulphuretted Hydrogen Water		"	0	0	3
Talc		"	0	1	6
Tannin, pure		"	0	1	6
Tin, Grain		per lb.	0	1	6
" Granulated		"	0	2	0
" Foil		"	0	3	0
" Chloride, common		per oz	0	0	2
" " pure		"	0	0	6
" Bichloride		"	0	3	6
" Nitro Muriate		"	0	0	3
" Oxide, common		"	0	0	3
" Protoxide, pure		"	0	1	0
" Peroxide, pure		"	0	1	0
" Protosulphuret		"	0	1	0
" Bisulphuret		"	0	1	0
Turmeric, Tincture		"	0	0	4

		£	s.	d.
Titanium, Oxide	per oz.	0	6	0
" Peroxide	"	0	6	0
Tripoli, for Daguerreotype (best)	"	0	0	6
Tungsten, Peroxide	"	0	3	0
Uranium, Nitrate	"	0	2	6
" Oxide	"	0	2	6
Urea, pure	"	0	8	0
" Nitrate	"	0	8	0
Zinc, Cake	per lb.	0	0	4
" Granulated	"	0	0	8
" Foil	per oz.	0	0	6
" free from Arsenic	"	0	0	3
" Acetate	"	0	0	6
" Carbonate, pure	"	0	0	6
" Chloride	"	0	0	3
" " pure white	"	0	0	6
" Cyanide	"	0	4	0
" Iodide (variable)	"	0	3	6
" Nitrate	"	0	0	6
" Oxide, precipitated	"	0	0	3
" " pure	"	0	0	6
" Sulphate, crystal	per lb.	0	1	0
" " pure	per oz.	0	0	6
" Sulphuret	"	0	1	0
" " native	per lb.	0	1	0

The above prices are subject to variation.

APPARATUS FOR ILLUSTRATING THE PHENOMENA OF HEAT.

	£	s.	d.
Brass Bar, and Gauge for showing the expansion of metals by heat	0	6	6
Brass ball and ring for ditto . 5s., 7s 6d., and	0	10	0
Compound metal bar for showing the unequal expansion of metals by heat . 2s. 6d. and	0	7	0
Ditto ditto mounted on stand 5s. and	0	10	0
Pyrometer (Daniel's) for indicating high temperatures, constructed for inserting in a furnace £4 to	6	0	0
Ditto (Ferguson's) for showing the relative expansions of rods of different metals, with lamp complete . . . . . £3 10s. and	5	5	0
Thermometers, (*see page* 64.)			
Apparatus for showing the relative expansion of different liquids by equal temperature . .	2	5	0
Apparatus for showing the expansion of air by heat . . . . . from 2s. 6d to	0	15	0
Apparatus consisting of a cylinder of metal and wood for illustrating the unequal conduction of heat . . . . 2s and	0	3	6
Compound cross of dissimilar metals for showing their different conducting powers by inflaming phosphorus at each of the ends . . . . 5s. and	0	7	6
Apparatus for demonstrating the imperfect-conducting property of water	0	10	6
Apparatus for showing the process by which fluids become heated	0	5	0
Apparatus for showing the heat evolved during the mixture of sulphuric acid and water .	0	7	6

	£	s.	d.
Apparatus for illustrating the principles of ventilation	0	7	6
Apparatus for showing the condensation in volume by mixture of sulphuric acid and water, and the heat evolved . . . . . . 4s. and	0	7	6
Pocket condenser for igniting German tinder by the compression of air . . . 3s. 6d and	0	7	6
German tinder for ditto. . . . . . per oz.	0	1	0
Apparatus for showing the force of contraction in a heated iron rod when cooled, by its snapping an iron bar . . . . . . 15s. and	1	1	0
Apparatus for showing the principle of warming buildings by hot water	0	12	6
Apparatus illustrating the principle of the descending stove and the upright position of flame . . . . . . 7s. 6d. and	0	10	6
Tin canisters with prepared surfaces illustrating that the time required for fluids to become heated or cooled depends upon the nature of the exterior surface . . . . . . 2s. and	0	8	0
Metal discs for showing the absorption or radiation of heat	0	7	6
REFLECTORS, silver-plated or polished zinc, for experiments on radiant heat, per pair £2 2s., £3 3s., and	4	4	0
Iron stands for ditto. . . . . . . from	0	3	6
Steam Engines,			
MARCET's steam apparatus consisting of iron boiler on stand, thermometer, barometer, tube, stopcock, and jet complete, adapted for illustrating the theory of latent heat, and the phenomena of temperature and elastic force of steam generated under high pressure	3	13	6
Apparatus for the investigation of the laws of latent caloric with steam at the atmospheric pressure	4	14	6

METEOROLOGY.

The science of Meteorology having of late made such rapid strides, it has become necessary to revise the class of Apparatus used in its prosecution.

It is a matter of the greatest importance to the Meteorologist that the Instruments he is called upon to use should be as accurate as our present capabilities will admit of, as it is only by the use of the most perfect that observations are to be depended on, or indeed possess any real value.

The Instruments and Apparatus enumerated in the following list are manufactured with the greatest care; the Thermometers Barometers, &c. being compared with standard instruments before leaving the establishment.

BAROMETERS.

	£	s.	d.
Common Pedestal Barometer . .	0	10	0
Ditto, superior, with exposed tube, ivory face, and thermometer	1	1	0
Ditto, with metal scale and larger tube . . .	1	10	0
Ditto, best, in square-head mahogany frame, ivory scale, with thermometer, and screw at bottom, for convenience and security in travelling . . .	3	15	0
Ditto, in rosewood	4	4	0
Ditto, in rosewood or mahogany frames, with double scale and thermometer, and glass cistern	7	7	0
Best Standard Barometer on mahogany board, with perpendicular adjustments, reading to 1-500th of an inch, a most complete and efficient instrument for meteorological purposes . .	10	10	0
Fowne's Syphon Barometer on mahogany board, with divided scale for accurately reading the difference in the levels of the mercury . . .	1	10	0
Ditto, best kind, with iron stop-cock	2	10	0
Mountain Barometers (Gay Lussac's), in brass case, and thermometer attached	5	5	0
Ditto, with portable stand	7	7	0
Ditto, (Inglefield's) from	4	4	0

	£	s.	d.
Marine Barometer, mounted in brass, with brass arm and gymbals	2	2	0
Ditto, in mahogany frame, with ivory scale, brass arm, &c. &c.	2	10	0
Ditto, superior	3	3	0
Ditto, best kind and construction	4	14	6
Thermo-Barometer (portable), in leather case	3	3	0
Sympiesometers, of improved kinds and construction £3 3s. and	4	4	0
Ditto (pocket), in leather case	3	10	0
Wheel Barometer, mounted in mahogany frame, with thermometer	2	15	0
Ditto, in rosewood	3	3	0
Ditto, superior, in rose-wood or walnut-wood frame	4	4	0
Ditto, best, with iron stop-cock, for safety in travelling	5	5	0
Ditto, rosewood inlaid with pearl, very handsome and ornamental £5 5s 0d. and	7	7	0
Aneroid Barometer, with metal face and case	2	15	0
Ditto, with thermometer	3	3	0
Ditto, with scale, accurately and minutely divided all round for mountain purposes	3	13	6

HYGROMETERS.

Mason's Hygrometer, simplest form, with box-wood scales, metal cistern in japanned tin case	0	15	0
Ditto, with ivory scales and glass cistern, in japanned tin case	1	5	0
Ditto, on brass support, and packed in mahogany case	1	15	0
Ditto, best, portable, on brass tripod stand, with isolated thermometers, formulæ, and tables complete, for accurate meteorological purposes	3	3	0
Regnault's Condensing Hygrometer, with aspirator complete, a most delicate meteorological instrument	6	6	0
Daniel's Dewpoint Hygrometer, in morocco case, with ether-bottle complete	2	5	0
De Luc's Whalebone Hygrometer	2	2	0
Leslie's Hygrometer	1	1	0
Sausseur's Hygrometer	2	2	0

THERMOMETERS.

	£	s.	d.
Common 8-inch boxwood scale thermometer	0	1	6
Superior 8-inch ditto	0	2	6
Ditto 8-inch ditto, with enamel tube	0	4	0
Ditto 10-inch ditto	0	6	0
BATH THERMOMETER, with box-wood scale, in japanned tin case	0	5	0
Ditto, with ivory scale	0	7	0
IVORY SCALE THERMOMETER, 8-inch, mounted on ebony	0	7	6
Ditto 10-inch ditto	0	9	6
Ditto, best, with stand for table use	1	1	0
Ditto, handsome carved ivory pedestal under glass shade . . . . . £1 10s. 0d. to	3	3	0
POCKET THERMOMETERS, metal scale, in morocco case	0	8	6
Ditto, larger size	0	13	0
Ditto, small ivory scale, in German silver case, 12s. 6d. &	0	15	0
Ditto, in box-wood, oval frame, with sunk tube	0	9	6
Ditto, ivory frame	0	12	0
WINDOW THERMOMETER, ivory scale, glass tube, mounted in mahogany frame, with metal top, 17s. 6d. and	1	10	0
BOTANICAL THERMOMETERS, with box-wood scales, in copper or tin cases . . . . £0 5s. 0d to	0	15	0
Ditto, mounted, in strong glass cylinders, for insertion in hot-beds, &c.	0	18	0
STANDARD THERMOMETERS, on brass scales	5	5	0
Ditto, on glass scales	4	4	0
SUGAR BAKERS' THERMOMETERS . . . . 16s. and	1	1	0
Spirit Thermometers, for low temperature . . 9s. to	0	15	0
Differential Thermometers . . . . . 12s. and	0	16	0
BREQUET'S Metal ditto . . . . £2 2s. and	3	3	0
Thermometer, for ascertaining the temperature of the Earth at different depths . . 15s. and	1	1	0

	£	s.	d.
Thermometer, for ascertaining the heat of the body .	1	1	0
CHEMICAL THERMOMETER, with boxwood scale, graduated to 300°	0	3	6
Ditto, " graduated to 400°, 4s. to	0	6	6
Ditto, with brass hinge, and jointed boxwood scale, to allow of the bulb being immersed without injury to the scale, graduated to 400° . . 6s. 6d. to	0	12	0
Ditto, superior " 600° . . .	0	12	0
Ditto, with scale on white glass, enclosed in glass tube	0	18	0
Ditto, with enamel tube, and hinged metal scale, 400°	0	14	0
Ditto, " " 600°	0	16	0
Ditto, graduated on stem, for inserting in the tubulure of retorts, &c., 400°	0	12	0
Ditto, " " 600°	0	18	0
Ditto, with paper scale enclosed in glass tube, 220°	0	6	0
Ditto, " " 300°	0	8	0
BREWERS' THERMOMETERS, 8in. metal scale, in japanned tin case	0	3	6
Ditto, 10 in. "	0	4	0
Ditto, 14 in. "	0	6	0
Ditto, 14 in., enamel tube, ditto	0	8	0
Ditto, 14 in., " in copper case	0	10	6
Ditto, 14 in., " " rivetted, and very strong	0	15	0

REGISTERING THERMOMETERS.

Thermometer, with boxwood scale, for registering maximum temperatures . . .	0	8	0
Ditto, for minimum temperatures. . . .	0	7	6
Ditto, NEGRETTI'S Improved	1	1	0
Ditto, Minimum	0	17	6
Ditto, Day and Night, for maximum or minimum temperatures	0	15	0

	£	s.	d.
Thermometer, Superior, with brass bracket, to admit of inclination in setting the indices	0	18	4
Ditto, Best, with cylindrical bulb, and brass bracket	1	1	0
SIX'S REGISTERING THERMOMETER, for maximum and minimum temperatures, in japanned tin cases, with double magnets:—			
10 in., boxwood scale	1	2	6
10 in., zinc scale	1	5	0
12 in., boxwood scale	1	5	0
12 in., zinc scale	1	7	6
14 in., boxwood scale	1	6	6
14 in., zinc scale	1	10	0
14 in., glass scale	1	15	0

PLUVIOMETERS, OR RAIN GAUGES.

	£	s.	d.
Pluviometer, japanned tin, with divided rod, showing the number of cubic inches and also gallons per acre	0	15	0
Ditto, japanned tin or copper, with divided rod and float, £1 5s. and	2	2	0
Ditto, CROSLEY'S Self-Registering	4	4	0
RAIN GAUGE, HOWARD'S, with graduated glass measure	1	15	0
ATMOMETER, ANDERSON'S, for ascertaining the amount of evaporation from any wet surface	2	2	0

ANEMOMETERS, OR WIND GAUGES.

	£	s.	d.
Anemometer, LIND'S, for showing the force and direction of the wind	1	1	0
Ditto, WHEWELL'S Registering, complete	10	10	0
ÆTHRIOSCOPE, LESLIE'S, for measuring degrees of cold produced from a clear sky	3	15	0

FRICTIONAL ELECTRICITY.

In no other branch of science is there so much diversity in the manifestations of a subtile power as in Electricity, and none in which such scope exists for the display of ingenuity in devising Apparatus and Instruments for the full elucidation of all the phenomena connected with it; almost every day enables us to add some new fact, or some illustration of one previously known, to an already copious Catalogue, and it is presumed that the subjoined List will contain all the most recent improvements introduced in the structure, both theoretical and practical, of the instruments there enumerated. Great attention has especially been paid to the arrangement of the Plate Electrical Machines, they will now be found to be far more powerful and give more satisfactory results than those constructed formerly

Messrs. Bland & Long would respectfully suggest to those about to purchase Electrical Apparatus for purposes of Class Illustration, &c., that an efficient and powerful Machine should have the first attention, as it is more desirable to add to the selection of Apparatus from time to time, than to be troubled with a Machine not sufficiently energetic to perform some of the most instructive and beautiful experiments in the science.

PLATE MACHINES.

Cuthbertson's Circular Plate Electrical Machine, mounted in French-polished mahogany frame, with brass conductor, and ball and wire:—

				£	s.	d.
No. 1.	Plate,	9 in.	diameter	2	15	0
" 2.	"	12	"	4	4	0
" 3.	"	15	"	5	10	0
" 4.	"	18	"	7	7	0
" 5.	"	24	"	10	10	0
" 6.	"	30	"	16	0	0
" 7.	"	36	"	22	10	0
" 8.	"	42	"	46	0	0
" 9.	"	48	"	50	0	0
" 10.	"	60	"	60	0	0

Nos. 8, 9, and 10 are mounted with two insulated rubbers, and with conical conductor, on separate stand.

Woodward's Double Circular Plate Electrical Machine, mounted in French-polished mahogany frame, with Positive and Negative conductors:—

	£	s.	d.
No. 1. Plate 12 in. diameter	9	9	0
" 2. " 18 "	13	0	0
" 3. " 24 "	20	0	0

Harris's Form of Circular Plate Machine, mounted in French-polished mahogany frame, with brass Positive and Negative conductors:—

No. 1. Plate 18 in. diameter	16	0	0
" 2. " 24 "	20	0	0
" 3. " 36 "	30	0	0
" 4. " 48 "	60	0	0

Cylinder Electrical Machines, with wood conductors covered with tin foil, mounted on mahogany stands:—

	£	s.	d.
No. 1. size of Cylinder, 6 in. by 4 in.	1	1	0
" 2. " 7 — 5	1	10	0
" 3. " 9 — 6	2	0	0

Ditto, with brass conductors:—

No. 1. size of Cylinder, 6 in. by 4 in.	1	10	0
" 2. " 7 — 5	1	17	6
" 3. " 9 — 6	2	15	0
" 4. " 10 — 8	5	10	0
" 5. " 12 — 9	6	10	0
" 6. " 14 — 10	9	9	0

Leyden Jars, with mahogany covers, brass knob, &c.:—

	£	s.	d.
No. 1 ¼ pint capacity	0	2	6
" 2. ½ pint "	0	3	6
" 3. 1 pint "	0	6	0
" 4. 2 pints "	0	8	6
" 5 3 pints "	0	10	6
" 6 4 pints "	0	15	0
" 7. 8 pints "	1	1	0

Larger sizes made to order.

Sets of Leyden Jars, in mahogany trays, with brass connections, forming powerful Leyden Batteries, from £2 2s. to 21 0 0

	£	s.	d.
Two Leyden Jars, mounted, for explaining the Franklinian Theory . . . . . 10s. 6d. to	0	17	6
Medical Leyden Jars, with hook, and arrangement for regulating the intensity of the shock, 6s.6d., 7s.6d., &	0	10	0
Glass Jar, with movable metal coating, for showing that the electricity is on the surface of the glass, and not on the metal coating	0	14	0
Glass Jars, Faraday's, with wire gauze mounting, for demonstrating the inductive action of the Leyden Jar	0	10	6
Diamond Jars . each, 6s., 9s., 12s. 6d., 17s. 6d., and	1	5	0

ELECTROMETERS AND ELECTROSCOPES.

	£	s.	d.
Henley's Quadrant Electrometer, with divided arc, 5s. &	0	7	6
Lane's Discharging Electrometer, 4s. 6d., 5s. 6d., and	0	7	0
Cuthbertson's Universal Discharging Electrometer, for discharging large quantities of electricity . .	2	2	0
Harris's Unit Jar Electrometer, with graduated arm for passing known quantities of electricity into Leyden Jars or batteries . . . . . £1 1s., and	1	15	0
Harris's Discharging Electrometer £1 1s., and	1	15	0
Harris's Electro-Thermometer, consisting of a delicate Air Thermometer, with wires passing through the bulb, which on connection with the source of electricity by becoming heated, cause the ascent of a coloured fluid in the tube, thereby showing the amount of electricity passing through the wire	1	10	0
Harris's Improved Lane's Electrometer . . .	1	10	0
Harris's Hydrostatical Electrometer	8	8	0
Harris's Balance Beam Electrometer, for estimating by weight the amount of attraction in oppositely electrical surfaces	4	4	0
Harris's Double Quadrant Electroscope, £1 1s., and	1	10	0
Bennett's Gold Leaf Electroscope, with Singer's improvement of superior insulation, 10s., 15s., and	1	1	0
Ditto, with condensing plates attached, for detection of minute quantities of electricity, £1 10s., £2 10s., &	4	4	0
Cavallo's Pith Ball Electroscope, for indicating electrical changes in the atmosphere . . . 10s. and	0	15	0
Saussure's Electroscope, for detection of atmospheric electricity	1	5	0

	£	s.	d.
SAUSSURE's Electroscope, with graduated arc, for showing the amount of the electric force	1	10	0
Haüy's Needle Electroscope, for showing the electrical condition of minerals, &c. 5s. 6d., and	0	7	6
HARRIS's Needle Electroscope	0	15	0
HARE's Single Gold Leaf Electroscope. 17s. 6d., and	1	5	0
BOHNENBURGER's Single Leaf quality Electroscope, with a pair of ZAMBONI's dry piles, very sensitive to slight variations of electrical excitation, showing the particular quality of the same £4 4s., and	5	5	0
Single Gold Leaf quality Electroscope, with one dry pile, suitable for showing feeble electrical excitation, and useful for experiments in atmospheric electricity, £2 2s., and	3	3	0
COULOMB's Torsion Electrometer, a very delicate instrument, for measuring minute quantities of electricity	2	5	0
PELTIER's Magnetic Electrometer, for experiments in Atmospheric Electricity, a very delicate and accurate instrument	3	3	0

ELECTRICAL EXPERIMENTS.

	£	s.	d.
INSULATED STOOLS, each, 10s., 15s. and	1	1	0
Glass tubes for shewing electrical excitation 2s. to	0	5	0
Rods of resin, sealing-wax, shellac, for ditto, 7s. 6d. and	0	10	6
Metal rod, with glass handle for ditto 7s. 6d. to	0	15	0
HENLEY's UNIVERSAL DISCHARGER and PRESS, for showing the deflagration of metals, and passing shocks through different substances £1 1s. and	1	10	0
Ditto, with forceps and handles, for use in galvanic electricity	2	2	0
Image plates, on brass stand, for showing the effects of electrical attraction, and repulsion 9s. and	0	12	6
Ditto, with insulated support, and adjusting upper-plate 15s. and	1	1	0
Pith figures for ditto, plain, each	0	1	0
Ditto, jointed, "	0	2	0
Pith ball stands 3s. 6d. and	0	5	6
Ditto, superior, with adjusting ball and wire	0	7	6
Pith balls, for use with ditto per doz.	0	1	0
Discharging rods, with insulated handles, plain, 3s.6d., &	0	5	0

	£	s.	d.
Discharging Rods, jointed . . 7s. 6d., 10s., and	0	12	6
Medical directors, for applying electricity to different parts of the body . . . each	0	5	0
Jointed director, for fitting into prime conductor of electrical machine, very useful in directing the electric fluid to apparatus . . . . 7s. 6d. and	0	10	6
Electrophorus (Volta's) . . 10s. 6d., £1 1s. to	5	5	0
Electrical See Saw	0	15	0
" Swing	0	10	0
" Swan	0	2	0
" Figures of mermaids, &c.	0	5	0
" Spider	0	1	0
" Sportsman . . . . 15s., 20s. and	1	5	0
" Cannon, for firing gunpowder	0	5	6
" Ditto, for mixed gases	0	12	0
" Ditto, " mounted on wheels	0	17	6
" Pistol	0	6	0
" Fly or Whirl	0	3	6
" Ditto, set of three, on one stand	0	8	6
" Inclined Plane . . . . 18s and	1	1	0
" Flask, with valve, for exhausting	0	6	6
" Bomb	0	5	0
" Orrery . . 5s., 7s. 6d., and	0	10	6
" Cylinders, from . . . . 2s. 6d. to	1	1	0
" Cement . . . . . . per lb	0	2	0
" Condensers . . . . . . per pair	1	1	0
" Ditto, with insulated supports and apparatus for adjusting distances	2	2	0
" Windmill	0	13	6
" Crane . . . 7s. 6d. and	0	10	6
Set of three bells, to suspend from conductor of electrical machine	0	7	6
Set of five ditto, on insulated stand . . 16s. and	1	1	0
Set of eight ditto, or Gamut, with revolving whirl	1	15	0
Apparatus for showing the rotation of an insulated vane between two points, in opposite electrical states 10s. &	0	15	0
Apparatus for illustrating the theory of thunder clouds	0	14	0

	£	s.	d.
Harris's Thunder Cloud Needle, with connections for Leyden Jar	0	8	6
Apparatus for showing the perforation of bodies by the electrical discharge	0	15	0
Apparatus for the ignition of phosphorus 7s 6d. and	0	15	0
Sturgeon's Apparatus for firing gunpowder	0	9	0
Thunder House, for illustrating the use and necessity of continuity in lightning conductors 5s. 6d. and	0	7	6
Powder House, for demonstrating the same 18s. and	1	1	0
Obelisk, for illustrating the properties of lightning conductors 6s. 6d. and	0	10	6
Fire House, for showing the ignition of combustible materials, and the heat evolved by the electric discharge	0	13	6
Luminous Conductor, or Aurora Borealis tube, for showing the effect of electricity in passing through a rarefied medium, and also the phenomenon of the falling star 10s. 6d., 18s., and	1	5	0
Syringe, for exhausting ditto 7s.6d., and	0	10	6
Glass Globe, with stopcock, for showing the Electric Light in vacuo	1	10	0
Ditto, with forceps for charcoal points, for use in Galvanic electricity	1	15	0
Luminous Word, in frame 7s.6d. and	0	10	6
" Star " 4s. "	0	5	6
" Bird " 4s. "	0	5	6
" Plane, of different colours	0	12	0
" Discharger, consisting of a bent tube with iron chain inside 7s. 6d., 10s. 6d., and	0	15	0
Hand Spirals, various colours 3s. 6d. and	0	5	6
Set of five Spirals, on mahogany pedestal, with central revolving arm	1	8	0
Ditto, Superior	1	15	0
Revolving Spirals	0	13	0
Carved Head, with hair, for showing that bodies similarly electrified repel each other 5s. and	0	7	6
Colored Glass and Paper Plumes to exhibit the same, 2s. 6d. and	0	5	6
Egg Stand, for showing the luminous appearance of eggs, oranges, &c., when the fluid is passed through them, mahogany 5s. 6d. and	0	7	6

	£	s.	d.
Egg Stand, brass mounted, and glass tube, 15s. and	1	1	0
Bucket and Syphon	0	5	0
Magic Picture, in frame	0	6	6
Hare's Jointed Forceps, for holding fine metallic wires when passing electric discharges through them, 21s. &	1	10	0
Adams' Combined Apparatus, consisting of Electrical Flask, two Leyden Jars, Luminous Conductor, Insulating Pillar, and exhausting Syringe	3	3	0
Apparatus for inflaming Phosphorus by the inclination of the flame of a taper to the Negative pole, when connected with an Electrical Machine, 15s. and	1	1	0
Brass Cup, for igniting Æther or Spirits of Wine by the Electric Spark . 2s. and	0	4	0
Biot's Apparatus, consisting of an insulated copper ball, with glass-handled hemispherical cups fitting over its surface, for showing the distribution of electricity on the surface of insulated conductors, £2 2s. and	3	3	0
Richmann's Apparatus, for illustrating the action of the Leyden Jar	1	1	0
Biot's Apparatus, for showing the effect of increased surface in diminishing the intensity of electricity, the quantity still remaining the same	1	10	0
De Londe's Lightning Plane	1	10	0
Ditto, larger sizes . . . . . £2 10s. and	3	10	0
Faraday's Wire Gauze Cages, for showing the residence of electricity on the outside of an insulated hollow metallic body, without reference to the nature of its surface	0	10	6
Faraday's Bent Electrical Conductor, with two different sized brass balls, for showing that between conducting surfaces the spark in disruptive discharges is modified by the difference of size of discharging or receiving surfaces . 6s. 6d., 9s., and	0	15	0
Faraday's Hollow Brass Sphere and tubular handle, with pointed wire within, for showing the influence of surface on the electrical discharge	0	7	6
Faraday's Wire Gauze mounted Glass Jar, for demonstrating the inductive principle of the Leyden Jar	0	14	0
Insulated Brass Conductor, with pith balls suspended, for showing electrical induction . . 5s. and	0	7	6
Insulated Wood Stands, for suspending light substances for illustrating attraction and repulsion	0	4	6
Ditto, Brass	0	12	6

		£	s.	d.
Conductors for Electrical Machines, japanned Tin,	3s. 6d., 5s. 6d., and	0	7	6
Ditto, Brass	. 6s. 6d., 12s. 6d., and	1	1	0
Glass Jars, for coating with Tin foil . .	per lb.	0	1	6
Tin foil	"	0	3	0
Cramps for fastening Electrical Machine or Apparatus to table, Iron . . .	per pair	0	3	6
Ditto, Brass	" 5s. &	0	7	6
Brass Chain	. per yard	0	0	4
Amalgam	. per box	0	1	0
Glass Rod, for electrical supports . .	per lb.	0	1	6
Cylinders	. from 2s. 6d. to	1	1	0

Glass Legs for Stools :—
4 in. long, 8d. 4½ in., 10d. 5 in., 1s. 3d.,
Larger sizes, per lb., 2s. 6d.

Glass Handles, for insulated dischargers, &c. :—
3 in. long, 1s. 4 in., 1s. 2d. 8 in., 1s. 3d.

Circular Glass Plates, cut and polished, with hole in centre, for Electrical Machines :—

Diameter,	9 in.	12 in.	15 in.	18 in.	20 in.	24 in.	30 in.
Price	6s.	12s.	20s.	30s.	40s.	60s.	100s.

Balls of Brass, with screw for wire :—

¼ in. diam., each, 2d.	½ in., 3d.	¾ in., 4d.	⅞ in., 6d.
1 in. diam., " 7d.	1¼ in., 9d.	1½ 1s.6d.	2 in. 2s.6d.

Balls of Brass, with wires and shoulders, for Leyden Jars :—
for ¼ pint size, each, 1s.3d. ½ pint, 1s. 6d. 1 pint, 2s.
2 pints, " 3s. 4 pints, 4s. 6 pints, 7s.6d.

Balls of Ivory, Bone, Ebony, Boxwood, &c., for showing different colored sparks by the electric discharge, from 6d. to 3s.6d.

HYDRO-ELECTRIC MACHINES.

	£	s.	d.
Armstrong's Hydro-Electric Machine, complete, with insulated conductor, extra steam jets, discharging rod and chain	14	0	0
Larger sizes . . . . . . £20, £30, and	50	0	0

This Machine consists of a strong high-pressure boiler, insulated, with the proper means of raising the steam; a series of jets for the generation of electricity by the action of the issuing steam; insulated conductor, jointed discharger, and everything necessary for the performance of experiments in Hydro-Electricity.

VOLTAIC ELECTRICITY OR GALVANISM.

This branch of natural science has reference to those phenomena in Electricity which are produced by or are dependent on Chemical action. The instruments in this department, enumerated below, will, it is anticipated, be found to possess all the requirements for its complete elucidation.

	£	s.	d.
Plates of Copper and Zinc, furnished with glass handles, for showing the development of electricity by contact	0	7	6
Plates of Zinc and Copper, for illustrating the direction of the current . . . . . . per pair	0	0	6
Wires of Silver and Zinc, soldered together, for Volta's *Couronne de Tasses* . . . per doz.	0	7	0
The Pile of Volta, consisting of 25 pairs of Zinc and Copper discs, soldered together	0	15	0
Ditto, consisting of 50 pair of plates, supported on suitable stand	1	1	0
Copper and Zinc Discs for the above . . per doz.	0	4	0
De Luc's Column, or Pile, formed of alternate discs of Silver, dry paper, and Zinc, mounted in glass tube, with brass terminations . . . £1 11s 6d. and	3	3	0
Zamboni's Column, consisting of 1,000 pair of discs, of Silver paper and black oxide of Manganese, with dry paper interposed, cased in sulphur, with brass termini	0	15	0
Series of Zamboni's Piles, arranged for intensity, £5 5s. to	10	10	0
Pair of Zinc and Copper Sieves, with insulated handles, for showing the production of electricity by the sifting of various metallic filings on to a delicate Electroscope	0	10	6
Faraday's Experiment, for showing the phenomena of an electric current, independently of the contact of dissimilar metals . . 10s. 6d. and	0	15	0

GALVANIC BATTERIES.

	£	s.	d.
Cruikshank's Battery, of 25 plates of Copper and Zinc, in mahogany trough, the plates 2¼ in. square . .	1	1	0
Ditto, 50 plates	1	15	0
Ditto, 100 plates	3	3	0
Ditto, 200 plates	5	5	0
Ditto, 50 plates, 3 in. square	2	10	0
Ditto, 50 plates, 4 in. square	3	10	0

	£	s.	d.
WOLLASTON'S Battery of 12 pair of plates, in Wedgewood ware trough	2	2	0
WOLLASTON'S Calorimeter, for showing the heating effects of a current of galvanism. It consists of a Zinc plate surrounded by one of Copper, with terminations for attaching a fine wire of Platinum	0	7	6
HARE'S Calorimeter	5	5	0
STURGEON'S CYLINDRICAL BATTERY, consisting of a movable cylinder of Zinc placed between two cylinders of Copper . . . . 5s., 7s. 6d., 10s 6d., and	1	1	0
MULLINS'S BATTERY, consisting of a Copper cylinder enclosed in membrane, and a cylinder of Zinc exterior to it . . . . 5s., 6s. 6d., and	0	14	0
A series of MULLINS'S BATTERIES, arranged in mahogany tray, with connections complete . £1 10s. to	5	5	0

DANIELL'S BATTERY.—The elements in this arrangement are a Cylinder of Copper which forms the containing vessel, and a rod of Zinc within a porous tube placed in the Copper vessel.

No. 1	size of	Copper cylinder 6 in. high,	by 3 in. diam.			0	5	0
" 2,	"	9	"	3	"	0	7	6
" 3,	"	12	"	3	"	0	10	6
" 4,	"	18	"	3	"	0	16	0

	£	s.	d.
Series of Six No. 1 DANIELL'S Batteries, in mahogany tray, with quantity and intensity connections, and terminal wires	1	12	6
Ditto, No. 2,	2	7	6
Ditto, No. 3,	3	3	0
Ditto, No. 4,	4	17	6

SMEE'S BATTERIES, consisting of a Platinized Silver plate placed between two pieces of amalgamated Zinc, and charged with dilute Sulphuric acid :—

Round Pots.						Square Pots.					
	Size of Silver.			s.	d.		Size of Silver.			s.	d.
No. 1.	4 in.	by	3 in.	8	6	No. 1.	4 in.	by	3 in.	9	6
" 2.	6	—	3¾	11	6	" 2.	6	—	3	12	6
" 3.	5½	—	4½	14	0	" 3.	5½	—	4½	14	0
" 4.	7	—	5	21	0	" 4.	7	—	5	22	6

		£	s.	d.
Series of Six No. 1 SMEE'S BATTERIES, arranged in mahogany tray, with quantity and intensity connections and terminal wires	round pots	2	15	0
Ditto	square do.	3	3	0

	£	s.	d.
Series of Six No. 2 size, in mahogany tray, with connections round pots	3	15	0
Ditto square do.	4	0	0
Series of Six No. 3. size, in mahogany tray, complete, "	4	10	0
Set of 12 Smee's Batteries, size of Silver, 4½ by 4 in., fitted in Wollaston's Trough, forming a very energetic Battery, with terminal wires	5	5	0
Ditto, size of Silver, 5 by 4½ in.	6	6	0

An exceedingly powerful and efficient Battery, as used by the Port of London, &c., for blowing-up sunken vessels in the Thames, and also by engineers for blasting rocks, &c.

	£	s.	d.
Apparatus for attaching to the same, for containing the charge of gunpowder, with Platinum wire, complete	0	3	6
Copper wire, thoroughly insulated, for submarine use.			

Maynooth or Callan's Battery, consisting of a cast-iron trough, which acts as a containing vessel, and porous pot, with a plate of amalgamated zinc, the outer vessel is charged with Nitric Acid, and the porous tube with a mixture of Sulphuric Acid and water:—

	£	s.	d.
No. 1. size of cast-iron trough, 5 in. by 4 in. each	0	7	6
" 2. " 7 — 6 "	0	10	6

Grove's Battery.—The elements of this arrangement are Zinc and Platinum separated by a flat porous medium, and charged with Nitric Acid in contact with the Platinum, and dilute Sulphuric Acid with the Zinc plates:—

	£	s.	d.
No. 1, in flat cells, size of Platinum plate, 5 in. by 3 in.,	0	10	0
" 2. " " 5½ — 3½	0	15	0
" 3. " " 6 — 4	1	1	0
Set of Four No. 1 Grove's Batteries, in mahogany tray, with wires and connections	2	10	0
Set of Four No 2,	3	10	0
" No. 3, very powerful	5	0	0
Set of Eight No. 1 size	4	15	0
" No. 2 size	7	0	0
" No. 3 size	9	9	0
" 50 No. 1 size, capable of evolving 100 cubic inches of the mixed gases per minute	30	0	0
Set of 50 No. 3 size, for the exhibition of the luminous arc between charcoal points, rapid decomposition of water, fusion of metals, &c.	58	0	0

	£	s.	d.
Grove's Batteries, in round pots, with cylindrical Zinc and narrow slips of Platinum . 2s. 6d. and 5s. each.			
Set of 12 ditto, in mahogany tray . . £1 5s. and	1	12	6
Grove's Gas Battery, formed of two glass tubes, hermetically sealed, each containing a strip of Platinized Platinum inverted in a vessel containing dilute Sulphuric Acid, when in use one of the tubes is to be filled with Oxygen and the other with Hydrogen gas	1	1	0
Set of Four ditto, mounted on mahogany stand	4	4	0
Carbon Batteries, consisting of a pole of carbon in porous tube surrounded with a cylinder of amalgamated Zinc . 6s and	0	10	0
Single Cell Electrotype Apparatus, consisting of a cylindrical jar with porous pot, and plate of amalgamated Zinc . from	0	2	6
Improved Single Cell arrangement, suitable for taking Electrotype impressions of medals, seals, &c., 5s., 7s.6d., & 10s.6d.			
Mason's Apparatus, for obtaining copies of two medals at the same time, with the consumption of only one equivalent of Zinc	0	7	6
Single Cell Apparatus, consisting of square Wedgewood ware jar, with perforated strainer for crystals, porous pot, and amalgamated Zinc wires and screws, complete . 7s. 6d. and	0	10	6
Precipitating Troughs of mahogany lined with cement, with Battery and binding screws, complete for Electrotype purposes:			
No. 1 size, for plates 7 in. by 4 in.	1	5	0
" 2, " 9 — 7	1	15	0
" 3, " 12 — 12	2	17	6
Large Precipitating Trough, with six Batteries, No. 4. size, the trough of strong wood lined with gutta-percha, with wires, connecting-screws, &c., complete, for covering a surface of 200 square inches	10	10	0
Apparatus for the decomposition of water:— Single tube, 5s. | Double tube, 7s. 6d.			
Ditto, larger, single tube	0	18	0
Ditto, double	1	1	0
Ditto, " tubes, graduated into cubic inches, tenths, and hundredths	1	10	0
Large double-tube decomposition Apparatus, with stopcocks, to prevent the necessity of continually filling the tubes	3	3	0

	£	s.	d.
Faraday's Voltameter, for ascertaining the quantity of an electric current by the amount of gas liberated	1	1	0
Ditto, of larger size, suitable for powerful currents, with extra graduated jar . . £2 12s. 6d. and	5	5	0
Gassiot's Voltameter, with contrivance for increasing or decreasing surface of Platinum Electrodes at pleasure	3	3	0
Bachoffner's Voltameter, with graduated tube to tenths and hundredths . . .	1	1	0
The convenience of this Instrument consists in being able to re-fill the tube by merely inverting the Apparatus.			
Faraday's Apparatus, for showing the decomposition of neutral salts, composed of a trough divided into two partitions, by muslin screens 10s. and	0	15	0
Improved form of the above Apparatus, for enabling the operator to substitute one diaphragm for another .	1	1	0
V Tubes, for decomposition of the neutral salts, 5s., 10s.6d., & 21s.			
Pair of Platinum Plates, supported on glass pillars, for the electrolysis of alkalies . . . £1 10s. and	3	3	0
Becquerel's Apparatus, for the decomposition of various salts	0	5	0
Pepy's Apparatus, for the decomposition of alkalies, suitable for the lecture table	1	11	6
Fine Platinum, Gold, Silver, and Steel wires, for showing the heating effects of a Battery current.			
Apparatus for producing **Nobili's** prismatic colored rings, by the electrolytic decomposition of Acetate of Lead . . . 9s. 6d. to	1	1	0
Apparatus to show the heating effects of a current of Galvanism, consisting of a Platinum wire enclosed in a suitable glass tube, with brass fittings £1 5s. and	2	12	6
Air-tight Tube, for heating a Platinum wire in media of different densities . £2 12s. 6d. and	3	3	0
Chain, composed of alternate links of Silver & Platinum wires, for illustrating the heating effects of a Voltaic current on metals of different conducting powers .	0	7	6
Model, to illustrate the mode of raising sunken vessels, by the explosion of gunpowder with the Voltaic current . £1 1s., £2 2s., and	3	3	0
Voltaic Powder Cannon, for firing gunpowder at any distance by the agency of galvanism 7s. 6d. to	1	1	0
Henley's Universal Discharger and Press, for the ignition of fine wires, charcoal points, decomposition of various substances by the Voltaic currrent . £1 10s. and	2	2	0

	£	s.	d.
De la Rue's Discharger, with the charcoal or electro holders, arranged as radii from a centre; the opposing points are made to approximate by a rack and pinion motion . . . . £1 10s. and	2	2	0
Apparatus, consisting of a Glass Globe with sliding wire, stopcock, forceps, &c., for exhibiting the Electric Light in vacuo, and the decomposition of gaseous matter, by the ignition of charcoal electrodes through galvanic agency	1	15	0
Ditto, larger, with ball and socket joint . . .	3	3	0
Books of Gold-leaf, for deflagration	0	1	9
Ditto, Silver "	0	1	6
Ditto, Copper "	0	0	2

Porous Tubes, of very superior manufacture, either in white or red clay, cylindrical:—

height.		diameter.		s.	d.	height.		diameter.		s.	d.
2 in.	by	1¼ in.,	each	0	1½	9 in.	by	2 in.,	each	0	8
3	"	1⅓	"	0	2	10	"	2⅜	"	0	10
4	"	1½	"	0	3	11	"	2⅜	"	1	2
5	"	1¾	"	0	4	12	"	2⅜	"	1	6
6	"	2	"	0	5	15	"	2⅜	"	2	0
7	"	2	"	0	6	18	"	2⅜	"	3	0
8	"	2	"	0	6						

Porous Pots, flat:—

4½ in.	by 3 in.	by 1 in.,	each,	5d.
5½	— 4½	— 1	"	9d.
6	— 4½	— 1	"	1s.2d.

and larger sizes in proportion.

Battery Jars, rectangular, mortar ware, to resist the acuo of acids:

5 in.	by 4 in.	by 2 in.,	each,	1s. 6d.
5	— 4	— 2½	"	1s. 2d.
6½	— 4½	— 2½	"	2s.
6½	— 5½	— 2½	"	2s. 8d.
4⅝	— 2⅞	— 1¾	"	1s.

Porous linings for ditto, . 6d.

5 in. by 3¼ in. by 1⅞ in. each, 1s. 4d.

Porous linings for ditto, " 6d.

		£	s.	d.
Wollaston's Galvanic Battery Trough, 12 cells:—				
17 in. by 5 in. by 5½ in., outside measurement	each	0	16	0
Square Electrotype Cells, of porcelain, with perforated shelves and strainers:—				
5½ in. by 5½ in. by 5½ in., 5s. | 8 in. by 8 in. by 8 in., 8s.				
Glass Tubes, with lips turned over, for Single Cell Apparatus:—				
2½ in. high, 2 in. dr. 6d. | 3½ — 3, 6d. | 3½ — 4, 9d.				
Binding Screws, various shapes and sizes, from 6d. to 2s. each.				
Sulphate of Copper	per lb.	0	0	8
Pure Plumbago	per oz.	0	0	6
Amalgamated Zinc Plates of sizes	per lb.	0	1	6
Fusible Metal	“	0	5	6
Copper Wire, for connections	“	0	1	6
“ Foil “	“	0	3	0
Plaster Casts, various	2d. to	0	1	0
Stearine, for taking moulds of ditto	per lb.	0	2	0
White Wax	“	0	3	0
Platinized Silver, for Smee's Batteries	per oz., 10s. and	0	11	0

APPARATUS FOR ELECTRO-SILVERING & GILDING.

		£	s.	d.
Single Cell Apparatus, with porous Pot	3s. 6d. and	0	5	6
Ditto, fitted with outer Tin vessel, for containing warm water, to keep the solutions at an equal temperature		0	7	6
Apparatus for gilding or silvering small articles, complete, with Gold and Silver foil and solutions		2	2	0
Ditto, of an improved form, consisting of Galvanic Battery, and Precipitating Cell, binding screws, without Gold or Silver plates, or solution:—				
For articles, size 4½ in. square		1	1	0
“ 6 “		2	5	0
“ 12 “		5	10	0
Solution of Gold for Electro-gilding	per oz.	0	5	0
Ditto, of Silver, for Plating	“	0	1	0
Cyanide of Potassium	per lb., 6s., “	0	0	6
Oxide of Gold	per dram	0	18	0
“ Silver	per oz.	0	7	6
Gold Foil and Wire	per dr.	0	15	0
Silver “	per oz.	0	8	6

THERMO-ELECTRICITY.

The effects of heat in producing Electrical currents under certain conditions, form one of the most interesting and instructive studies in Electrical science; through its agency all the phenomena of Galvanism may be exhibited in a very marked and satisfactory manner. The Instruments in this section are of simple construction, consisting mostly of pairs of dissimilar metals arranged so that the exciting element may be under the control of the operator.

	£	s.	d.
Compound Bar of *Bismuth and Antimony* . . .	0	7	6
This arrangement shows the production of a Thermo-Electric current, by the deflection of a Galvanometer needle, on applying heat to its extremity.			
Ditto, on Brass stand, with Mercury cups . . .	0	14	0
Haüy's Apparatus, for showing the Electro-polar state developed by a crystal of Tourmaline, on elevating its temperature	0	10	6
SEEBECK's rectangular frame of *Bismuth and Antimony*, with Magnetic Needle inside the frame, which is deflected on the application of heat to this arrangement, 8s. 6d. and	0	10	6
Rectangular frame of *Bismuth and Copper*, mounted the same as the foregoing . . . . 8s. 6d. and	0	10	6
Thermo-Electric Battery, consisting of eight pairs of Bismuth and Antimony bars, or of German Silver and Brass	0	5	0
Ditto, consisting of 10 pair	0	7	6
Ditto, " 20 pair	0	15	0
MELLONI'S THERMO-ELECTRIC BATTERY, on Brass stand, with mahogany frame formed of a series of bars of Bismuth and Antimony . £1 5s., £1 10s. 6d., and	2	2	0
This arrangement is so sensitive that the slightest variation in temperature causes a devolopment of Electricity.			
DOVE'S THERMO-ELECTRIC BATTERY, composed of Iron and Platinum wires, for generating a constant current of electricity	4	4	0
LOCKE'S Spiral Thermo-Electric Battery, composed of bars of Antimony and Bismuth	3	3	0
CUMMING'S Stellar form Thermo-Electric Composite Battery	2	12	6

	£	s.	d.
Wire Frames of Silver and Platinum, for rotating on the poles of a permanent Magnet	0	5	0
Ditto, with support to show Thermo-Electric rotation, 5s. 6d. and	0	7	6
Apparatus, consisting of a permanent horse-shoe Magnet, on Brass Stand, with Spirit-lamp in centre, and a rectangular frame of Silver and Platinum on each pole, to show Thermo-Magnetic rotation . . .	1	1	0
Thermo-Electric wires of dissimilar metals, 1s., 2s.6d., & 3s.6d. ea.			
Peltier's Thermo-Electrical Hygrometer . .	0	10	6
Peltier's Apparatus, for showing the heat or cold produced at the point of contact in a compound bar of Bismuth and Antimony, on transmission of a Voltaic current in contrary directions	0	10	6
Peltier's Apparatus, consisting of a delicate Air Thermometer, the bulb of which contains a small compound bar of Bismuth and Antimony for showing the diminution of temperature by the ascent of a liquid in the bore of the tube, when a Voltaic current is passed through the bar	1	11	6
Peltier's Apparatus, for showing the reduction of temperature, by a Voltaic current traversing two dissimilar metals	0	10	6
Pouillet's Thermo-Electric Apparatus.—It consists of a bar of Bismuth bent twice at right angles, with wires from the ends communicating with the stand, for completing the electric circuit in any direction .	0	15	0

MAGNETISM.

This and the following section comprise a description of Instruments for carrying on investigations in a department of science of the utmost utility. The laws which regulate the action of the Magnetic needle under differing conditions, possess an interest to the philosopher second to no other subject, whether as regards their application to maritime purposes, or as indicating in a silent manner, the changes that are continually occurring in the meteorological condition of our planet.

Magnetic Steel Needles, with hard metal centres, 1s. 6d. to	0	5	0
Ditto, mounted with Agate centres . . . 5s. to	0	12	6
Astatic Needles " . . . . 7s. 6d. to	1	1	0
Brass Stands, with Steel points, for the suspension of Magnetic needles . . . . . 2s. 6d. to	0	7	6

		£	s.	d.
Magnetic Needle, mounted on Brass stand, for showing the polar state of mineralogical specimens		0	5	0
DIPPING NEEDLE, with Brass graduated Quadrant, for measuring the dip	10s. 6d. to	0	18	0
Ditto, with graduated circular metal ring	17s. 6d. to	1	5	0
Ditto, of best construction	from £5 5s. to	15	15	0
Ditto, arranged for showing the polarity also in one instrument, with graduated Quadrant		1	5	0
Bar Magnets, flat or cylindrical, single, or in pairs, from	2s. 6d. to	2	2	0
Horse-shoe Magnets, with soft Iron Armatures, from	6d. to	0	5	0
Ditto, combined bright Steel, 3 bar, 5 in. long		0	12	0
Ditto, " 5 " 5 "		0	18	0
Ditto, " 7 " 7 "		2	2	0
POCKET COMPASSES, in square or circular cases, with or without lever stop to the needle	2s. 6d. to	0	10	0
Ditto, in circular Brass boxes	2s. 6d. to	0	10	6
Ditto, superior kind, with enamel dial, and Agate cap to needle, in Morocco cases	7s. 6d. to	1	1	0
Ditto, mounted in Silver hunting case	£2 2s to	3	3	0
Ditto, " Gilt "	£2 2s. to	3	3	0
BOAT COMPASS, with Nautical floating card, in wood case		0	13	0
Ditto, in Brass box, with Gymbals	13s. and	1	5	0
MARINE AZIMUTH COMPASS, set in Gymbals, with sights for ascertaining the angular distance of objects from the magnetic meridian	£2 12s. 6d. to	15	15	0
SEA or STEERING COMPASS, with floating card, and hung in Gymbals	£1 5s., £1 10s., to	4	4	0
CABIN COMPASS, set in Gymbals, to hang up inverted, the floating card being suspended on a point in the glass cover	£1 16s. to	3	3	0
MINER'S COMPASS, with needle mounted on Agate centre and folding sights, in mahogany case, for taking horizontal angles	£1 11s. 6d. and	2	12	6
Ditto, superior kind, with telescope cross-levels, and mahogany staff	£7 7s. and	10	10	0

	£	s.	d.
Kater's Azimuth Compass, with floating magnetic card, and folding sight	2	12	6
Military Compass, for determining horizontal angles, with floating card, and folding sights . . .	2	12	6
Surveying Compass, with Silver divided ring, floating card, folding sights, and triangular prismatic Lens, in case, complete	4	10	0
Loadstone, or Natural Magnet, in slices, each 1s. 6d. to	1	1	0
Ditto, mounted in case, with soft Iron Armature, from £1 5s. to	10	10	0
Sieves, for sifting Iron filings on to a piece of paper or glass placed over the poles of a Magnet, to show the magnetic curves . 3s. 6d. and	0	4	6
Stars, Cubes, Rings, Discs, Cylinders, &c., of soft Iron, to illustrate Magnetic induction . each, 3d. to	0	1	6
Y shaped Armature, for illustrating the law of induced Magnetism . . . . . 2s. to	0	5	0
Magnetic Toys, representing Mermaids, Ships, Swans, Fishes, &c., to show Magnetic attraction and repulsion, from 6d. to	0	5	0
Apparatus, for illustrating Barlow's Magnetic Compensator, or Metallic Plate for neutralizing the effect of local attraction on the Ship's Compass £3 3s. and	5	5	0
Apparatus for exhibiting the magnetic properties of different metals, by motion . . . £4 4s. to	7	7	0
Apparatus for showing the capacity of various metals for the development of Magnetism, by motion . .	3	3	0
Sturgeon's Magnetometer, for illustrating the magnetic properties of different metals, in motion . . .	2	2	0
Barlow's Apparatus, consisting of an artificial globe, with wire distributed over its surface, for conducting a Voltaic current, for exhibiting the phenomena of terrestrial electricity, and the probable electric origin of the action of the Mariner's Compass £3 13s. 6d. and	4	14	6
Harris's Apparatus, for showing the transient magnetic state induced upon metallic substances, and for exhibiting the influence of screens of the different metals, in arresting the progress of magnetic induction . . . . . £10 10s. to	18	18	0

MAGNETO-ELECTRICITY.

	£	s.	d.
MAGNETO-ELECTRIC MACHINE, small size, uni-current, for Medical purposes . . . . £5 5s. and	6	6	0
Magneto-Electric Machine, of large size, consisting of a large 7-bar powerful Compound Permanent Horse-shoe Magnet, mounted vertically on mahogany stand, multiplying wheel-motion adapted to two rotating Armatures, for producing quantity and intensity effects, with a mahogany case fitting over the Machine, containing in a drawer the following Apparatus:—pair of shock handles, apparatus to show the decomposition of water, steel springs, iron and steel wire, for showing the combustion of metals, apparatus for the ignition of platinum wire, and for inflaming Æther, and Mercury cups, for showing the brilliant combustion of Mercury	12	12	0
MAGNETO ELECTRIC INDUCTIVE MACHINE.—This Apparatus consists of a soft-iron Armature wound with coils of insulated wire, which on rapid revolution before the poles of an induced Magnet, shows the experiment of inductive electrical phenomena with very marked effect . . . . . £8 8s. to	25	0	0
RITCHIE'S MAGNETO-ELECTRIC MACHINE, for producing the Spark . . . . . . £2 12s. 6d. and	3	13	6
Small Apparatus, for obtaining the Spark from a large compound Magnet	0	5	0
Apparatus to illustrate *Electro-Dynamic Induction*, and the production of electricity by Magnetism, £1 11s. 6d., £2 2s., and	3	3	0
Apparatus, consisting of a circular disc of Copper, capable of rotation between the poles of a Permanent Horse-Shoe Magnet, for showing the production of permanent currents of electricity, produced by Magnetism . . . . . . £1 11s. 6d. and	2	12	6

	£	s.	d.
Faraday's Apparatus, for showing the production of Magneto-Electric currents by the induction of Magnetism in a bar of soft-iron	2	2	0
Faraday's Apparatus, to show the production of electricity by Magnetism, consisting of a thin wood cylinder having a coil of insulated wire wound on it, with binding-screws attached to the terminal wires, for connection with a delicate Galvanometer: on inserting the pole of a bar Magnet into the cylinder, the Galvanometer-needle will be deflected in a direction depending upon the pole introduced	1	1	0
Dove's Differential Inductometer, formed of two hollow wood cylinders, wound with stout insulated Copper wire, constituting the primary coils, second cylinders of wood and fine insulated wires, for secondary coils. This instrument, when connected with a delicate Galvanometer, shows interesting results, by inserting within the cylinders various forms ot ferruginous and metallic bodies . .	5	5	0
Arago's Apparatus, for showing the retarding effects of a massive metallic ring on the oscillations of a Magnet free to move on its centres, £3 13s. 6d. and	5	0	0
Sturgeon's Apparatus, for showing the effects produced by a Permanent Magnet on the oscillations of different Metallic Discs, with discs, but exclusive of Magnet	2	2	0

ELECTRO-MAGNETISM

Is a highly-important branch of Natural Philosophy, and one that has produced some of the most useful discoveries and inventions of modern times. The Electric Telegraph is here represented in all its phases, from the first discovery of the influence of an Electric current on a Magnetic Needle, by ŒRSTED, to the perfect application of the fact to practice, by WHEATSTONE and others.

The laws of the mysterious influence of Terrestrial Magnetism on the Magnetic Needle are investigated, and Instruments will be found to illustrate the subject in a most perfect manner, as likewise Apparatus for investigating the relation existing between Electricity and Magnetism.

	£	s.	d.
ŒRSTED's Experiment, for showing the effect of a Voltaic current upon a Magnetic Needle, by being transmitted above, below, or round it, best make, on brass stand, 10s. 6d. and	0	15	0
Ditto, common, on mahogany stand . . 5s. and	0	7	6
Apparatus, for showing the effects of a current of Galvanism on the directive property of the Magnetic Needle	0	10	0
GALVANOMETER, of simplest kind, consisting of a rectangular frame of insulated Copper wire with a Magnetic Needle within, suspended by a point over a Compass card, on a mahogany board . 5s. 6d., 7s. 6d., and	0	10	0
BACHOFFNER's GALVANOMETER, with graduated card and Astatic Needles, on circular mahogany stand, under glass shade	1	1	0
TORSION GALVANOMETER, with movable coil, Astatic Needles, and divided metal ring, mounted on mahogany stand, with levelling screws; a very delicate instrument for measuring the force of Galvanic currents	3	3	0
GALVANOMETER, of most improved construction, mounted on a circular mahogany base, with levelling screws, and Astatic Needle, 6 in. long, vibrating on a graduated metallic ring, attached to a rectangular coil of fine insulated wire. . . £3 3s., £4 4s., and	5	5	0
MELLONI's MAGNETIC GALVANOMETER, with reading microscope, complete, forming a very delicate instrument for measuring feeble Galvanic currents . .	6	6	0

	£	s.	d.
Galvanometer, for measuring, detecting and multiplying the effects of Galvanic currents of low tension, 5s. 6d., 7s. 6d., and	0	10	6
Cumming's Gold-Leaf Galvanoscope.—This instrument consists of a slip of Gold-leaf enclosed within a glass tube, having binding-screws at each end, for connection with a source of Voltaic electricity when a current is passed through the Gold-leaf and a horse-shoe permanent Magnet held outside the tube, the direction is shown by the inclination of the Gold-leaf towards one of its Magnetic poles . .	1	5	0
Galvanoscope, consisting of a suspended Magnetic needle placed between a series of four vertical spiral coils of Copper wire, capable of very near approximation to the Needle	1	1	0
This instrument is very sensitive to the detection of a feeble Voltaic current.			
Ditto, enclosed under glass shade, to protect the needle from currents of air . . .	1	10	0
Electro-Magnets, of soft Iron, made in the form of a horse-shoe, and wound with insulated Copper wire, capable, on connection with a Voltaic battery, of sustaining heavy weights, with Armature and hook, 4s. 6d., 7s. 6d., 12s. 6d., 15s., £1 1s., and	2	2	0
Ditto, of larger size and very great power, suitable for lecturing purposes . . . £3 3s., £5 5s., and	10	10	0
Glass Tube, with Copper wire wound round it, for showing the Magnetizing of Steel Needles by the Voltaic current	0	2	6
Helical Coil of insulated Copper wire, with binding screw termini, for showing the same experiment, 2s. 6d. and	0	5	0
Vertical Helix, on stand, for showing the suspension of the Needle within the coil . . .	0	15	0
Apparatus, for showing the rotation of a Magnet on its axis, by the action of a Galvanic current . . .	1	1	0
Apparatus, for showing the rotation of a Permanent Magnet round a conducting wire	1	1	0
Apparatus, for showing the revolution of 3 bar Magnets round a conducting wire	1	5	0
Faraday's Apparatus, for showing the rotation of a conducting wire round the pole of a Magnet, 7s. 6d. and	0	10	6

	£	s.	d.
Faraday's Apparatus, for showing the simultaneous rotation of a Magnet round a conducting wire, and a conducting wire round a Magnet	1	1	0
Apparatus, with two Magnets, showing the different rotations of opposite poles of the Magnet round the same conducting wire	1	11	6
Apparatus, to show the tendency of a Mobile electrified wire to take a position perpendicular to the Magnetic meridian . . . . 7s. 6d. and	0	10	6
Apparatus for showing the mutual attraction and repulsion of wires transmitting currents of Voltaic electricity	0	15	0
Apparatus, for showing the mutual attraction or repulsion of two wires, either in the same or opposite directions, whilst conducting a Voltaic current . .	0	15	0
Apparatus, for showing the mutual attraction of Electric and Magnetic currents . . . £1 5s. and	1	10	0
Apparatus, to show the mutual action of curvilinear and rectilinear currents. In this contrivance a Mobile vertical connecting-wire rotates by the influence of a fixed horizontal curvilinear wire	0	15	0
Apparatus, to illustrate the continued rotation of a wire whilst transmitting a rectilinear current, by being acted upon by a fixed wire transmitting a curvilinear current	0	15	0
Ritchie's Apparatus, to show continued rotation by the action of Electric currents	1	5	0
Apparatus, for showing the deflection and rotation of an Electrified wire about the pole of a horizontal Magnet, 15s. and	1	1	0
Apparatus, for showing the rotation of a coil of Copper wire between the poles of a Magnet	0	14	0
Rectangular Wire-Frame, complete, on stand, for rotating between the poles of a Permanent Horse-shoe Magnet	1	1	0
Marsh's Vibrating Wire, for showing the oscillating motion assumed by a suspended wire conveying a Voltaic current, when acted upon by the poles of a Permanent Horse-shoe Magnet	0	7	6
Apparatus, for showing in one instrument the rotating and oscillating motion of a conducting wire . . .	0	10	6
Sturgeon's Rotating Disc, of copper	0	8	6

	£	s.	d.
Barlow's Rotating Spur-Wheel . 5s. 6d. and	0	10	6
Ditto, double " . . 15s. and	1	1	0
Compound Horse-shoe Magnet, for use with the rotating disc and spur-wheel . 7s. 6d. and	0	10	0
Ritchie's Experiment, for exhibiting the rotation of an Electro-Magnet between the poles of a Permanent Horse-Shoe Magnet . . 12s. 6d. and	1	1	0
Apparatus, for showing the rotation of an Electro-Magnet between the poles of a soft iron horse-shoe	0	10	6
Barlow's Apparatus, for showing the rotation of two hollow metal cylinders round the poles of a Permanent Horse-Shoe Magnet	1	15	0
Apparatus, consisting of a Permanent Horse-Shoe Magnet on stand, with coil of wire on each pole to show the opposite rotation by the same current produced by the contrary poles of the Magnet . .	1	4	0
Compound Electro Magnetic Apparatus, consisting of a Permanent Horse-Shoe Magnet on stand, with levelling screws, sliding central pillar, two Mercury cups, two revolving Armatures, rotating coil, mobile wire frame, rotating cylinder and helical coil, complete	3	3	0
Dr. Golding Bird's Inversor, for altering the direction of a Voltaic current	0	18	0
Bachoffner's Electrepeter, for the same purpose .	0	18	0
Vibrating Electro-Magnet . . .	1	4	0
Saxton's Apparatus, consisting of a Permanent Magnet revolving in front of a horizontal induced Magnet .	3	3	0
Electro-Magnetic Needle, poised on an Agate cap, which on being connected with a source of Voltaic electricity, exhibits polarity and the phenomena of a Permanent Magnet	0	10	6
Terrestrial Rotating Induced Magnet 8s. 6d. and	0	10	6
Floating Battery, for showing the polarity of the sides of a coil of insulated wire when conveying an electric current, the wire having a tendency to place itself at right angles to the Magnetic meridian . .	0	5	0
Ditto, with elongated helical coil, for showing that the properties possessed by Voltaic Magnets are similar to those of ordinary Magnets	0	5	0
Cylindrical Bar Magnet, for use with ditto, 2s. 6d. and	0	3	6

	£	s.	d.
AMPERE'S ROTATING CYLINDRICAL BATTERY. This Apparatus, when excited with dilute Sulphuric Acid, and placed on one of the poles of a Permanent Horse-Shoe Magnet, shows the rotation of each of the metallic elements in opposite directions	0	6	0
Ditto, mounted on a Permanent Horse-Shoe Magnet on brass stand	0	15	0
Ditto, consisting of two of the batteries on a Permanent Horse-Shoe Magnet, with brass foot and levelling screws	1	4	0
PRIMARY COILS, with handles for giving shocks, also useful for increasing the intensity of Voltaic currents . . . . 12s. 6d., £1 1s., and	2	2	0
Ditto, mounted vertically on mahogany stand, with vibrating Platinum break, pair of handles, and water regulator for increasing or diminishing the intensity of the shock . . . £1 1s., £1 10s., and	2	2	0
PRIMARY COILS, FOR MEDICAL PURPOSES. *See Section on "Medical Electricity."*			
SECONDARY ELECTRO-MAGNETIC COIL MACHINE, mounted horizontally on a mahogany stand, with revolving armature and Mercury break	0	10	0
Ditto, with Mercury break, consisting of a RITCHIE'S revolving Electro-Magnet, placed between the poles of a Permanent Horse-Shoe Magnet, with pair of brass handles, and bundle of soft Iron wires for regulating the intensity of the shock, £1 1s., £1 15s., &	2	2	0
Ditto, mounted vertically on mahogany stand, with pair of handles, Platinum vibrating break, and water regulator for regulating the intensity of the shock £1 1s., £1 10s., and	2	2	0
LOCKEY'S ELECTRO-MAGNETIC MACHINE, with scintillating circle, primary and secondary coils	4	14	6
DR. BIRD'S SELF-ACTING ELECTRO-MAGNETIC MACHINE, in mahogany case	6	6	0
BACHOFFNER'S ELECTRO-MAGNETIC MACHINE, with primary and secondary coils. A very powerful instrument for giving shocks, showing Electro-Chemical decomposition, the different coloured sparks obtained by the combustion of the various metals, &c. &c., with pair of handles	3	10	0

	£	s.	d.
Bachhoffner's Electro-Magnetic Machine, &c., packed in French polished mahogany case with drawer, including Apparatus for the decomposition of water, cylindrical bar of iron, and bundle of iron wires for regulating the intensity of the shock, set of wheels and springs for showing the different colored sparks, file, and iron and steel wires for combustion, connecting wires for attaching the battery	5	10	0
Callan's Coil, with rotating Magnet, on stand, from	0	12	6
Henry's Ribbon Coil, for increasing the intensity of electricity, and also for showing the spark from a single Voltaic combination . . £1 10s. and	3	3	0
Lockey's Water Regulator, for regulating the intensity of Medical shocks, or currents of Galvanic electricity from coil machines, on mahogany stands, with binding screw connections . 5s., 7s. 6d., and	0	10	0
Sturgeon's Semi-Spiral Disc, for showing the combustion of the different metals	2	10	0
Gamut of Bells, mounted on mahogany support, with Ritchie's revolving Magnet in centre, having a clapper attached, which, on revolving, strikes the bells	3	3	0
Wheatstone's Rheostat, for adjusting and regulating a Galvanic current so as to obtain a constant degree of force	3	13	6
Ditto, for regulating Voltaic currents of small resistance . . . . £7 7s. and	9	9	0
Wheatstone's Differential Resistance Measurer, of various conductors of Electricity, £1 11s. 6d. and	2	2	0
Bain's Apparatus, for taking Soundings at Sea	2	10	0
Apparatus for ringing a bell by Electro-Magnetism, £1 5s. and	2	2	0
Model of a *Water Pump*, set in action by Electro-Magnetism	2	15	0
Model of a *Circular Saw*, actuated by the same means	2	15	0
Electro-Magnetic Motive Engines, of various designs, to illustrate the application of Electro-Magnetism to the production of motion . . . . £2 2s. to	21	0	0
Apparatus, to illustrate the action of the *Telegraph*, by the deflection of a single Magnetic Needle	1	1	0
Ditto, with improved arrangement, for conveying signals from one department of the premises to another, by ringing a signal bell	4	14	0

	£	s.	d.
Apparatus to illustrate *Wheatstone's Electro-Magnetic Telegraph* and communicator, for sending messages in one direction, through short distances . . .	7	7	0
Ditto, with call-bell attached	12	12	0
Apparatus, consisting of two *Wheatstone's Electro-Magnetic Needle Telegraphs*, for communicating through any required distance, with signal-bell attached, exclusive of wire . . . . . . £20 to	30	0	0
Model of *Wheatstone's Electro-Magnetic Clock*, for transmitting time from one standard clock to various dials in other parts of a building £2 12s. 6d. and	3	13	6

Copper wire, covered with cotton of superior insulating quality, for Electro-Magnetic experiments, the construction of coils, communication between telegraphs, &c., &c.:—

					s.	d.
No. 6,	averaging	8 ft.	to 1 lb.,	per lb.	2	0
" 9,	"	20	"	"	2	3
" 12,	"	35	"	"	2	6
" 14,	"	50	"	"	3	0
" 16,	"	75	"	"	3	0
" 18,	"	120	"	"	3	3
" 23,	"	400	"	"	4	6
" 30,	"	1300	"	"	7	0
" 32,	"	2000	"	"	8	6

Fine Copper Wire, covered with silk, for use in the construction of Telegraphs, 15s. and 20s. per lb.

MEDICAL GALVANISM.

THE beneficial effect of the Galvanic current in cases of Rheumatism, Paralysis, Sciatica, and all nervous disorders, is now too generally admitted to require more than a slight notice.

The essential points in an efficient Galvanic machine are, that the current should pass in *one direction* only, and also that the current used should proceed from the battery, and should not be an induced current: these points are fully attained in the Medico-Galvanic Machines, and in the Magneto Machines, offered to the Medical profession and others in the following catalogue.

From the simplicity of the structure of the above-mentioned machines, there will not be found any difficulty in the use of them by patients themselves, where the services of a medical attendant cannot at all times be procured; this will be found a great convenience to travellers and persons residing in India or other distant parts. We shall commence the list by describing and giving directions for the use of

BLAND & LONG'S MEDICO-GALVANIC MACHINE, which consists of a vertical helix of insulated copper wire, within which at the centre is enclosed a bundle of fine iron wire; across the top of the machine is the platinum break, which is an arrangement for alternately making and breaking contact between the battery and the patient, giving the sensation of the Galvanic shock. Immediately in the front of the machine, between the two binding screws which hold the wires of the shock handles or directors, is situated the regulator, which gives the patient or operator the power of increasing or diminishing the amount of Electricity passing at a given time. The principle of its action will at once be perceived from the following description: The water regulator, invented by the Rev. F. Lockey, consists of a vertical glass tube, cemented into a brass socket at its bottom; the upper part is furnished with a cap, through which slides stiffly a tube or rod, having a handle or knob at the top; when in use the glass tube is partly filled with common water, and the sliding rod being pulled up so as just to touch its surface, the current before entering the patient has to traverse a certain distance of imperfectly conducting medium (water); if we wish to increase the shock we depress the sliding rod into the water, thereby shortening the distance to be traversed by the current. It will be seen from the foregoing that the current is capable by this means of the nicest adjustment, and that the same machine can be used for severe cases of paralysis, and also for the irritation of the most sensitive nerves of the system. The binding screws at the opposite side of the machine to the regulator are for connexion with the battery, which is on Smee's principle, namely, platinized silver and zinc.

The mode of using the *Medico-Galvanic Machine* is, first to charge the battery with a mixture of sulphuric acid and water, of the proportions of one part of acid to eight parts of water; when this mixture has cooled, it may be poured into the battery pot, and the plates immersed. The connecting wires are then to be made fast to the cramps and continued to the binding screws of the coil; if the break be in good adjustment, the hammer will begin immediately to vibrate, and a spark will be observed to pass between the front of the set screw on the top and the plate of platinum on the steel spring; if on the contrary the break be out of order, we have only to see that the point and plate of platinum are perfectly clean and free from dust, and then by steadily turning the set screw to bring the platinum point just in contact with the platinum plate; the slightest motion of the machine will now set the hammer in a state of vibration, and the spark will be seen as before. It is necessary to prevent the screw from gradually turning round; this is accomplished by means of a check nut at the underside of the bar, which, on being tightened, effectually prevents any motion of the screw.

The directors are now to be fastened through the intervention of their wires to the binding screws at the regulator side of the coil, and each tube being supplied at the end with a piece of damp sponge, can be applied to the parts affected in a most convenient manner.

	£	s.	d.
BLAND & LONG'S MEDICO-GALVANIC MACHINE, for the administration of Galvanic Electricity, fitted into case with battery, shock handles, complete . .	2	2	0
Ditto, larger, in mahogany case	3	3	0
Ditto, mounted in rosewood on square base, more powerful	4	4	0
Ditto, in ebony on square base, German silver fittings .	5	5	0
Ditto, considerably more powerful, with separate batteries, suitable for hospital use	8	8	0
Ditto, very powerful and efficient, with extra directors and batteries	15	15	0

MEDICAL MAGNETO-MACHINES.

The point which has been aimed at in the construction of these machines is, that without the inconvenience of acid or a battery, we might obtain a working power as efficient as that produced by our Medico-Galvanic Machines. The chief difficulty which prevented its accomplishment was this: machines of the kind, as ordinarily constructed, produced an alternating current, rendering them unfit for Medical use; this we have been enabled to overcome without the slightest diminution in power, and are able to recommend these elegant and portable Magneto-Machines to those requiring their aid, more especially to the profession residing in remote places, India, &c., in which situations they will be found particularly useful from the fact of their always remaining in action.

The *Magneto-Machine* consists essentially of a powerful magnet placed in a horizontal position, before the poles of which are caused to revolve by means of multiplying gear the armatures, covered with insulated copper wire, in which a current of Electricity or Galvanism is set up at certain points of its revolution. The spindle is furnished at the end, which passes between the poles of the magnet, with a contrivance by which means with the aid of spring connections pressing on this break the contact is made and broken at proper intervals during the revolution of the armatures. The directors are to be screwed to the terminal parts of the above-mentioned springs. At the side of the magnet is an index or *vernier*, and a scale is marked on the face of the arm of the magnet; a screw will also be found at the end of the box immediately behind the bend of the magnet, which allows by its rotation of the magnet being approximated to or withdrawn from the faces of the armature. The directors and wires are packed securely in a drawer which passes under the magnet.

Directions for using the Magneto-Machine for the administration of Medical Galvanism: Remove the piece of soft iron placed across the poles of the magnet, and turn the milled head outside the case until the magnet is at its farthest point from the revolving armature, which may be ascertained by referring to the brass scale at the side of the magnet; then screw on the small winch to the axis of the driving wheel, through an opening in the end of the case nearest the revolving armature, and having fastened the wires attached to the conductors, which are packed in the space under the magnet, and are accessible through the door at the end of the case, one to each of the binding screws attached to the springs, the machine is ready for use.

The directors may now be applied to the parts of the body requiring the stimulus, and on turning the winch and setting the armature in motion, a shock will pass through the patient. The strength of the shock is regulated by turning the milled head before mentioned, so that the magnet may be made to approach more nearly to the face of the revolving armature.

Another means of regulating the power is by a variation in the rate of revolution given to the armature, so that by a judicious use of these two methods every conceivable gradation of power can be obtained.

N.B. After using the machine, the soft iron keeper ought *invariably to be replaced*, otherwise the magnet is apt to deteriorate in power, and a diminution in the strength of the shock will be the consequence.

	£	s.	d.
Bland & Long's Magneto Machine, in mahogany case, directors, &c., complete	5	5	0
Ditto, larger and more powerful	6	6	0
Ditto, a very powerful and satisfactory instrument, with extra directors, &c., forming a most complete Apparatus for a public institution . . .	12	12	0

MEDICAL DIRECTORS.

As the Galvanic current requires to be transmitted through the different parts of the body, it becomes necessary to have the termini of the arrangement formed in different ways, in order to meet the requirements of each particular class of cases.

	£	s.	d.
Sponge directors . . . . per pair	0	5	0
Directors, for application of the current to the teeth, each	0	2	6
Ditto, ditto ditto ear, „	0	2	6
Ditto, ditto ditto eye, „	0	2	6
Ditto, ditto superior construction „	0	10	6
Ditto, ditto to the feet, abdomen, &c. „	0	3	6
DR. RADFORD'S Uterine Conductor . . . . „	0	12	6
Amalgamated Zinc Plates . . per pair, 9d. and	0	1	6
Covered Copper Wire, for the direction of the current, per lb.	0	3	0
LOCKEY'S Water Regulator, on separate foot, capable of being applied to any machine . . . 5s. and	0	10	6

SMEE'S BATTERIES. *See Section on "Galvanism."*

MECHANICS.

THE Illustration of the Laws of Motion, on which is based the whole science of Mechanics, will be found fully carried out in the series of Models detailed below; among which may be enumerated, Apparatus for demonstrating the laws of falling bodies, weight, and resistance, friction, &c., &c., conveying to the mind of the student much tangible information, and aiding considerably the labours of the Professor.

	£	s.	d.
MECHANICAL POWERS, in mahogany and boxwood, consisting of Levers, simple and compound; Pulleys, of various kinds; Wheel and Axle; Inclined Plane; Screws, of different pitch and sizes; Wedges; Capstan, &c., &c., with Weights, complete in case . .	3	3	0
Ditto, larger size, in mahogany and boxwood £5 5s. and	7	7	0
Ditto, in brass, more complete	20	0	0
Ditto, with Apparatus for demonstrating the laws of Motion, Gravity, and Equilibrium of Forces . .	40	0	0

	£	s.	d.
Set of Levers, comprising the three orders and the bent form . . . . . . 10s., 15s., and	1	1	0
Wheel and Axle, in frame . . . 10s., 15s., and	1	1	0
Systems of Pulleys, consisting of Simple, Compound, White's and Spanish Barton . 15s., £1 1s., and	1	10	0
Inclined Plane, with Carriage and Weights 10s. and	0	15	0
Apparatus for illustrating the action of the Wedge, on stand . . . . 15s., 25s., and	1	10	0
Model to show the formation of the Screw . 5s. and	0	7	6
Ditto, of Screw and Nut . . 7s. 6d., 10s. 6d., and	1	1	0
Ditto, to illustrate the action of Screws of different degrees of inclination . . . . 15s. and	1	1	0
Ditto, of Hunter's Compound Screw . 10s. and	1	5	0
Ditto, to illustrate the action of the Endless Screw, 15s. and	1	1	0
Inertia Apparatus, mounted on stand, with brass ball, 10s. and	0	15	0
Adhesion Plates, of glass, with handles . 10s. and	0	15	0
Apparatus for showing the adhesion between solids and liquids	5	5	0
Apparatus for illustrating the impenetrability of Matter . . . . 3s. 6d. and	0	5	0
Attwood's Machine for demonstrating the laws of Falling Bodies, with seconds' pendulum and weight, complete, on suitable stand	21	0	0
Ditto, less complete	6	6	0
Apparatus for determining the Centre of Gravity of irregularly-shaped bodies . . . . 15s. and	1	5	0
Apparatus for illustrating that the stability of a body depends upon the position of the Centre of Gravity. 5s. and	0	10	0
Double Cone and Inclined Plane, to show the Descent of the Centre of Gravity, whilst the Cone is apparently moving upwards . . 7s. 6d. and	0	10	6
Apparatus for illustrating the Parallelogram of Forces, with weights, friction rollers, &c., complete . .	5	5	0
Apparatus to show that a body takes the same time to descend the diameter or the chord of a circle, whatever the length of that chord may be . £1 5s. and	2	2	0
Model to illustrate that the time required for the descent of bodies down an inclined plane is proportional to its length . . . . £1 1s. and	1	15	0

	£	s.	d.
Apparatus to show the Parabolic Curve described by a projectile . . . . £1 5s. and	2	2	0
Apparatus to illustrate the Curve of quickest descent, £1 5s. and	2	2	0
Apparatus with divided arc, to demonstrate the Laws of Collision . . . . 15s. and	1	5	0
Model to illustrate the Composition of Force £2 2s. and	3	3	0
Apparatus to demonstrate that the time required for a falling body to reach the ground, is the same, whatever may be the force of projection . £2 2s. and	3	3	0
Model of common Balance, showing the various adjustments . . . . £3 3s. and	5	5	0
Model of Steelyard, or Roman Balance . . .	0	15	0
Ditto, of the Danish Balance . . . 15s. and	1	10	0
Ditto, of Bent Lever Balance . £1 10s and	2	10	0
White's Compound Pulley, in brass, 15s., £1 10s., and	2	2	0
Models to illustrate the properties and construction of the Arch . . . . 5s. and	2	2	0
Models of Hook's single and double Universal Joints, £1 10s. and	2	2	0
Whirling Table, and Apparatus complete, for illustrating the Laws of Central Forces	20	0	0
Small collections of Geometrical Planes and Solids .	0	6	6
Second series, with sections of the Cone, Cylinder, and Sphere	0	10	6
Larger size Solids, with sections of the Cone . .	0	18	0
Glass Models, for teaching Geometry and Crystallography	2	2	0
Dissected Cube, with Octahedron for its primitive nucleus	0	3	0
Ditto, with Tretrahedron for ditto	0	3	0
Ditto, with Rhombic Dodecahedron for ditto . .	0	3	6
Ditto, with Pentagonal Dodecahedron for ditto . .	0	3	6
Cones, with sections, in boxwood . . 3s. and	0	5	0
Larkin's Geometrical Solids, in box . 9s. to	1	10	0
Model for illustrating the process of Screw-cutting by machinery	6	6	0
Ditto, for showing the properties of the Spur, Crown, and Bevel Wheels	5	5	0
Ditto, of the Wheel and Pinion, and Rack and Pinion, showing the most perfect form of the teeth and leaves	6	6	0

HYDROSTATICS AND HYDRAULICS.

The laws which govern fluids in motion and at rest are susceptible of good illustration, and advantage having from time to time been taken of this capability, numerous methods have been devised to demonstrate in the most lucid manner possible these laws, bearing as they do on the success of most of our manufacturing machines. The instruments and Apparatus in the subjoined list, it is hoped, will meet the requirements of the lecturer and student.

	£	s.	d.
Hydrostatic Paradox.—An Apparatus for illustrating that the pressure exerted by liquids depends on the vertical height of the column, the bases remaining the same, and not on the quantity of fluid contained in the vessels. It consists of a stand with valve and weighted lever, with three glass vessels of different capacities but of the same height, and having bases of the same area . . £3 13s. 6d. and	7	7	0
Apparatus, for showing that the pressure of a liquid depends upon its perpendicular height, and not the diameter of the column . . . 5s. to	1	1	0
Apparatus, for illustrating the properties of fluids in transmitting pressures equally in every direction £3 3s., £5 5s., and	9	9	0
Apparatus, for showing that a small column of water will support a large quantity, in metal	1	10	0
Ditto, in glass . . 2s. 6d. and	0	5	0
Hydrostatic Bellows, for showing the equal pressure of fluids in every direction, and that the pressure is in proportion to the perpendicular height of the column . . £1 10s., £3 3s., £5 5s., and	7	7	0
Apparatus, to illustrate the upward pressure of fluids £5 5s., £7 7s., and	10	10	0
Apparatus, consisting of five glass vessels of different shapes, being connected with a trough containing water to show the disposition of fluids to maintain the same level . . . £2 10s. and	5	5	0
Apparatus, for illustrating the phenomena of spouting fluids . . . . £2 10s. and	5	5	0
Set of glass tubes, of small bore, for showing Capillary attraction . .	0	5	0

	£	s.	d.
Apparatus, consisting of two plates of glass for showing the curve produced by Capillary attraction when immersed in a fluid . . . . . 10s. and	0	15	0
Apparatus, to show the position in which fluids of different densities support each other . 5s. to	1	1	0
Apparatus, for illustrating that the quantity of fluid displaced by a floating body is equal in weight to its own bulk . . . . 10s., £1 1s., and	1	15	0

Hydrometers, Gravimeters, and Specific Gravity Apparatus. *See Section on "Chemistry."*

	£	s.	d.
Apparatus, for showing the action of intermitting and reciprocating springs	2	10	0
Working Model of Bramah's Hydrostatic Press £5 5s., £10 10s., and	15	15	0
Ditto Montgolfier's Water Ram . £5 5s. and	7	7	0
Ditto of the Centrifugal Pump . £3 3s. and	6	6	0
Vera's Rope Pump	7	7	0
Working Model of the Chain Pump	8	8	0
Ditto Barker's Centrifugal Mill £2 10s, £5 5s., and	7	7	0
Ditto Ordinary Lifting Pump, with metal barrel	1	1	0
Ditto ditto, with glass barrel . . . 18s. and	1	10	0
Ditto Force Pump, with glass barrel	1	1	0
Ditto ditto, with jet pipe attached for showing the action of the fire engine . . . . £1 10s. to	2	10	0
Ditto Lifting and Forcing Pumps, mounted on one stand, with water cistern . . £3 3s. and	5	5	0
Ditto De la Hire's Pump, acting as a Lifting and Force Pump, producing the effect of both with the friction of one only . . . . £4 4s. and	6	6	0
Ditto Archimedes' Screw . £1 15s, £3 3s., and	5	5	0
Ditto ditto, showing the action of the Persian Wheel for raising water . . . . £2 10s. to	10	0	0
Ditto Undershot Tide or Stream Wheel £2 2s. and	3	3	0
Ditto Overshot Wheel . . . £2 2s. and	3	3	0
Ditto Breast Wheel . . . . £2 2s. and	3	3	0
Apparatus, for showing that more water will pass from a reservoir through a short pipe than a simple aperture of same dimensions	0	12	0
Hollow Glass Figures, of divers, balloons, &c., each 2s. &	0	3	0
Tall Cylindrical Glass, for using with the same, 3s. 6d. &	0	5	0

	£	s.	d.
Syphons, glass or metal . . each 1s., 2s., 3s., to	0	10	0
Wurtemberg Syphon . . . . 2s. 6d. and	0	5	0
Tantalus Cup	0	8	6
Hero's Compressed Air Fountain . £2 2s. and	3	3	0
Artificial Fountain, set in action by Condensed Air, consisting of metal Cylinder, condensing Syringe, and set of Jets . . £2 2s., £3 3s., and	5	5	0

PNEUMATICS.

The Instruments described under this head, have reference to the elucidation of the laws connected with Aëriform bodies. They comprise illustrations of the elasticity, weight, expansion, &c., of Air, and are intended to assist in giving experimental and practical proof of various Theorems in Theoretical Pneumatics.

Great care and attention has been directed to the perfecting the various pieces of apparatus, and every precaution has been taken to insure accuracy; such as the grinding of the plates of pumps, the valves of the same, &c., &c.

In the selection of Pneumatic Apparatus, too much stress cannot be laid on the acquisition of a good and powerful Air Pump, more especially as the success of most of the experiments depends on its efficiency.

	£	s	d.
Syringes, for *exhausting* air from small vessels, each 7s. 6d., 10s., 15s., and	1	1	0
Ditto, for *condensing* air into reservoirs, each 7s. 6d., 10s., 15s., and	1	1	0
Ditto, for *exhausting* and *condensing*, useful for transferring air or gas from one vessel to another, 10s., 15s., £1 1s., and	1	10	0
Air Pump (single barrel), with close receiver, £1 1s., £1 5s., and	2	2	0
Ditto, with sloping barrel and Receiver . £2 2s. and	3	3	0
Ditto, with horizontal barrel and cramp, used in Organic Analysis . . . . £1 8s. to	2	10	0
Ditto, of large size, worked by a lever and toothed sector, mounted on mahogany stage, with Barometer Gauge and Receiver . . £12 12s. and	15	15	0

	£	s.	d.
Air Pump (**Smeaton's**), on mahogany stage, with Barometer and Syphon Gauges; a very efficient instrument for accurate exhaustion	35	0	0
Ditto (**Leslie's**), for making ice in any climate, with 3 Receiver plates, each 13 inches diameter, Receivers, glass sulphuric acid Dishes, Porous Pans, and Syphon Gauge, complete	50	0	0
No. 1. **Air Pump** (double barrel), mounted on a mahogany stage, with Barometer Gauge, and open and close Receivers; diameter of plate 13 inches	30	0	0
No. 2. Ditto, ditto, diameter of plate 10 inches, complete, with Barometer Gauge, and with open and close Receivers	19	0	0
No. 3. Ditto, ditto, mounted on raised mahogany frame, with Gauge Plate and Syphon Gauge, and 1 Receiver; diameter of plate 10 inches .	12	12	0
No. 4. Ditto, ditto, with Gauge Plate and Syphon Gauge, and 1 Receiver; raised plate, diameter 8½ inches	10	0	0
No. 5. Ditto, ditto, with Gauge Plate and Syphon Gauge, with plate not raised, and 1 Receiver	8	8	0
No. 6. Ditto, ditto, with 1 Receiver, but without Gauge Plate and Syphon Gauge	7	7	0
No. 7. Ditto, ditto, diameter of plate 7 inches, with 1 glass Receiver	6	0	0
No. 8. Ditto, ditto, diameter of plate 6 inches, with 1 glass Receiver	4	10	0
No. 9. Ditto, ditto, diameter of plate 5½ inches, with 1 glass Receiver	3	10	0
Receivers for Air Pumps, ground perfectly true, open or close . . . . per lb.	0	4	6
Marriotte's Experiment, for showing the variation of the elasticity of air with its density	3	3	0
Bent Glass Tube, with graduated scale, for showing the proportion existing between the density of elastic fluids to the pressure they sustain, in illustration of the law of Marriotte	0	10	6
Apparatus for showing that the space occupied by air, or an elastic fluid, is in proportion to its pressure, 15s. &	1	5	0
Torricellian Experiment, for showing that the oscillation of the quicksilver in a barometer tube, is due to the changes in the density of the atmosphere, 12s., 15s., and	0	18	0

	£	s.	d.
Filter Cup Experiment, for showing the porosity of wood . . . . 5s. 6d. and	0	7	6
Glass Receiver for ditto, ground at top and bottom, for use with ditto	0	2	6
Guinea and Feather Experiment, for showing that in a vacuum, substances of different weight descend in equal times . 1 fall, 10s., 2 fall, 15s., 3 fall,	1	2	6
Glass Receivers, for using with the above, ground at both ends . . per lb.	0	4	6
Balance Beam, with Cork ball and Counterpoise, for showing that bodies that are in equilibrio in air of ordinary density, are not so in vacuo . . .	0	10	0
Windmill Experiment, with two sets of vanes, capable of adjustment to any pitch. If one set of vanes be set parallel to their axis, and the other at right angles to axis, in air of ordinary density, the former when set in motion would come to a state of rest in a much shorter space of time than the latter, but in a vacuum they require the same time to return to the quiescent state . . . . . . £1 15s. and	2	2	0
Copper Bottle, Beam and Stand, with Counterpoise for demonstrating in a most satisfactory manner that air possesses weight	2	10	0
Apparatus, for showing the same fact on a smaller scale . . . . 18s. and	1	10	0
Hand Glass, for showing the pressure of the atmosphere	0	2	0
Bladder Glass, for explaining the same phenomenon. If a piece of bladder be tied on the larger end of this Apparatus when wet and allowed to dry, when placed upon the plate of an air pump and the air exhausted, the bladder will burst with a loud report, owing to the pressure of the external air . . .	0	2	6
Lung's Glass, for showing the elastic force of air	0	6	0
Artificial Fountain, for illustrating the same property of air by its forcing up a jet of water, 3s. 6d., 5s. 6d., &	0	9	0
Ditto, of larger size and most improved form, 12s., 15s., &	0	18	0
Bladder, Frame and Weights, for demonstrating the elasticity of air . . 5s. 6d., 7s. 6d., and	0	10	0
Bacchus Experiment, for showing the same phenomenon . . . . £1 8s. and	1	15	0
Balloons, of Goldbeaters' Skin, for placing under the Receiver of an Air Pump, for showing the elasticity of air or gases . . . . 1s. and	0	2	0

	£	s.	d.
Syringe and Lead Weight, for illustrating the pressure of the atmosphere . . . 7s. 6d., 10s., and	0	15	0
Apparatus, to illustrate the pressure and elastic force of air in one instrument . . 10s. 6d., 15s., and	1	1	0
Breaking Squares of thin glass, for showing the pressure and expansive properties of air . . each	0	1	3
Ditto, mounted, with valve	0	2	6
Wire Cage for covering ditto, to prevent accident to the Receiver	0	5	0
Thin Tin Vessel, with stop-cock, for showing in a very striking manner the pressure of the atmosphere. By generating steam inside the vessel, and suddenly condensing it by pouring cold water on the outside, the sides are forced in by the pressure of the atmosphere	0	5	6
Magdeburg Hemispheres, with pair of handles and stopcock on stand. This is a most satisfactory instrument for showing in a familiar way the great pressure of the atmosphere. 12s., 15s., 18s., 25s., and	1	15	0
Apparatus, for demonstrating that the pressure of the atmosphere is equal to nearly 15 lbs. for each square inch of surface	3	3	0

It consists of a brass box, one side of which is movable, and measures just 1 inch square, a lever is attached in a suitable manner at one end, and a weight at the graduated end indicates the amount of pressure exerted on the square inch, when the air is withdrawn from the underside of the movable side of the box.

	£	s.	d.
Single Transfer Plate, with stop-cock and jet, mounted on mahogany foot for showing the pressure produced by air of ordinary density by raising a jet of water 10s., 15s., and	1	0	0
Double Transfer Plates, for showing the expansibility and elastic force of air . £1 15s., £2 5s., and	3	3	0
Working Model of Diving Bell, with condensing pump, complete	1	5	0
Glass Vessel, for the immersion of ditto 12s. 6d. and	0	17	6
Models of Diving Bells, of larger size, with vessels for immersion . . . . . from £5 5s. to	15	15	0
Glass Flask, with brass cap and stop-cock for showing that fluids boil at a lower temperature under diminished pressure than at the ordinary pressure of the atmosphere . . . . 5s. and	0	7	6
Bell Experiment, for showing the effect of a rarefied medium on sound	0	10	0
Ditto, of best and most approved construction .	1	1	0

	£	s.	d.
GUNPOWDER Apparatus, for illustrating that air is a medium of sound . . . 10s. 6d., 15s., and	1	1	0
WATER HAMMER, for showing the fall of a liquid on a solid in a medium devoid of air, producing a loud sound like the sudden contact of inelastic bodies .	0	3	6
LESLIE's Apparatus, for freezing water in vacuo, consisting of a Sulphuric Acid dish, shallow porous vessel for containing the water to be frozen, tripod stand for holding the same, with glass Receiver ground perfectly air-tight . 10s., 15s., and	1	1	0
Porous Dishes, for use with the same . each	0	0	3
WOLLASTON'S CRYOPHORUS . . . . . 4s. and	0	7	6
Model, to show the action of the Common Lifting Pump, with metal barrel	1	1	0
Ditto, with glass barrel, to show the action of the valves . . . . . . 18s. and	1	1	0
Ditto, showing the action of the Force Pump, with glass barrel	1	1	0
Ditto, with reservoir and jet pipe attached, to show the action of the Fire Engine . . £1 10s. to	2	10	0
Ditto, Lifting and Force Pump, mounted on mahogany stand, with water cistern . . . £3 3s. and	5	5	0
Fruit Stand, for supporting fruit, &c. under the Receiver of an Air Pump . . . . 3s. 6d. and	0	4	6
Cartesian Divers . . . . each	0	2	0
Tall Cylindrical Glass for ditto . . 3s. 6d. and	0	5	0
FIRE-CLOUD FOUNTAIN, consisting of a strong copper vessel, with stop-cock, jet, lever handle, and condensing Syringe, to show the beautiful effect of ignited Spirits of Wine charged with Strontia, Baryta, &c., projected on the walls and ceiling of a darkened room, forming a most extraordinary exhibition . . .	6	6	0
BRASS PLATE, with stop-cock and metal pipe for showing experiments with foul air in connection with the Air Pump . . . . . . 12s. and	0	15	0
Brass Plate and Sliding Wire, useful for the bell, windmill, and other experiments . . 12s., 15s., and	1	1	0
Painted Sectional Model of AIR PUMP, showing the action of the Torricellian vacuum Gauge, opening and closing of Valves, and working of Pistons, 3½ feet square . . . £4 14s. 6d. and	6	6	0
Painted Sectional Model of FIRE ENGINE, 3½ feet long and 3 feet wide . . . £4 14s. 6d. and	6	6	0

ACOUSTICS.

This section treats of those Instruments that illustrate the nature and properties of sound, and the variation it undergoes in quality and intensity under different circumstances.

	£	s.	d.
Bell, with pendulum escapement attached to the hammer, for striking the Bell under the receiver of an *Air Pump*, to show the effect of atmospheres of different density on the conduction of sound . .	1	1	0
Sliding-tube arrangement, for increasing the intensity of the sound, in addition to the foregoing experiment .	2	12	6
Model, to show the composition of different modes of undulation, and for showing the normal or transverse undulations in a row of particles . .	4	14	6
Apparatus, formed of two series of curves drawn on a revolving cylinder, for showing progressive and stationary longitudinal undulations in a row of particles	3	18	6
Kaleidophone, Wheatstone's, for showing experimentally the principle of super-position of small motions, 10s. 6d., £1. 1s., and	1	11	6
Monochord, an instrument for exhibiting the relation and subdivision of musical sounds, £2 2s., £3 3s., and	5	5	0
Ditto, with arrangement for regulating the tension of a chord . . £4 14s. 6d., £5 10s. and	7	7	0
Apparatus, for showing the reflexion and propagation of a wave, and the conversion of progressive into stationary undulations . . . £1 1s., £2 2s., and	3	3	0
Apparatus, Biot's, for producing a grave harmonic from a single string . . . 15s. and	1	0	0

By the arrangement of this instrument a note can be produced one-fifth below that natural to the chord.

	£	s.	d.
Apparatus for showing the production of subordinate sounds or harmonics with a single string, with shifting weight . . 10s. 6d. and	0	15	0

	£	s.	d.
Apparatus for showing the relation existing between the tension of a chord and the time of vibration, £1 15s. &	2	2	0
Apparatus for showing the different sounds produced when glass tubes of dissimilar sizes are placed over an ignited jet of Hydrogen Gas . 7s. 6d., 10s., and	0	15	0
Apparatus, WHEATSTONE'S, for showing the mode of vibration in a tube open at both ends . .	1	11	6
SYREN. An instrument for determining the number of vibrations per second required for the production of a musical sound £3 10s. and	4	4	0
BELLOWS, with double riser, set of wood and metal-tongued pipes, wind-chest and sound-board . .	7	7	0
WILLIS'S TUBE for use with the above, for showing the production of vowel sounds . . £2 2s. and	3	3	0
Apparatus for proving that the ear is incapable of receiving the impression of a continuous tone if regular impulses do not occur in certain intervals of time . . £7 7s., £9 9s., and	12	12	0
Apparatus, consisting of an arrangement for showing the constant relation of musical intervals producing common chords, also discords, and to show the superior limits of the frequency of vibrations in producing an audible sound	9	9	0
Supports for sustaining rods whilst showing their transverse vibrations, with metal, wood, and glass rods, complete, for illustrating that the first harmonic division gives the double octave to the fundamental note, instead of the octave, as shown by the vibrating chord.	1	10	0
Set of Glass Plates, of different shapes, for showing the nodal points when set in a state of vibration, 5s., 7s. 6d., and	0	9	0
Apparatus for showing the movement of the nodal points on plates of glass, &c. . 9s., 12s. 6d., and	0	17	6
Apparatus for showing the nodes of an elastic medium, in a glass tube . .	1	5	0
Apparatus to show the interference of sound	0	9	0
Apparatus, TREVELYAN'S, for showing the production of a musical sound, by the heating and gradual cooling of a mass of metal . . . . . 10s. and	0	15	0

	£	s.	d.
Apparatus, consisting of various Glass Tubes, closed at one end, for showing the different vibrations of columns of air enclosed in them	0	10	6
Apparatus, consisting of a hemispherical glass vessel, over the circumference of which is suspended a set of cork balls: the glass vessel on being set in motion by a vibrating chord, shows in a very striking manner the nodes of an ordinary bell . . £1 5s. and	1	10	0
Apparatus for showing the effect of the longitudinal vibration of a metal rod to a set of parallel discs placed in a transverse position to the same	0	15	0
Apparatus to show the transverse vibrations of a chord in communication with a set of elastic surfaces parallel to it	0	15	0
Apparatus to show the set of undulations transmitted through a fluid to an elastic surface suspended in the same, and also from a solid body to a fluid	1	7	6
Apparatus for showing the transference of the transverse vibrations of a chord to an elastic membrane, and also the tangential vibrations of the same	0	16	0
Diapason, or Tuning Fork	0	5	0
Ditto, with glass flask, for showing the polarization of sound	0	7	6
Sets of Steel Wires wound in the form of a spiral, with hammer, mounted on a sounding board	0	7	6
Apparatus for illustrating the analogous effects existing between the effects of sonorous undulations and the interference of light	3	3	0

OPTICS.

The examination of the phenomena of light and vision constitutes the Science of Optics. Perhaps there is no more important branch of physical science than that which treats of the means of assisting natural vision, and none in which such extraordinary discoveries have been made in the constitution and relation of our planet to the rest of the universe, and also into the minute structure of the vegetable, animal, and mineral kingdoms.

The *telescope* and *microscope* are here represented, together with instruments for illustrating the polarization, reflection, &c. of light, in all their varied forms, down to the simple glass with its curved surfaces, so indispensable to the comfort of those whose natural vision requires assistance.

SPECTACLES.

Before proceeding to describe the various forms of spectacles and eye glasses, it may be as well to extract a few short rules laid down for the selection, &c. of *spectacles*, from a work recently published by Alfred Smee, Esq., F.R.S., to whom science is indebted for that most useful instrument the "*Optometer*," for determining the exact focus of the glasses required.

1. Spectacles should only be worn to correct the errors of the refracting humours.
2. The error of refracting power should be carefully ascertained by the *Optometer* before any spectacles are employed.
3. Spectacle frames should be exactly adapted to the width of the eyes.
4. It is necessary that the glasses should be central in the frame.

LONG SIGHT.

1. For long sight the glasses should not be too deep, otherwise vision is apt to become more impaired.
2. Distant objects should not be viewed through the glass in the long sight of declining years.
3. It is detrimental to use glasses continuously to near objects where the adjustment to distant objects is not complete.
4. Spectacles should not be employed to increase the size of objects, but reading glasses and microscopes should be substituted in their stead.

SHORT SIGHT.

1 Glasses may be safely employed to completely rectify the optical defect of short-sightedness.
2. When the adjustment of the eye is imperfect some latitude of compensation must be allowed for the exercise of the eye.
3. Short-sighted spectacles should have their axes directed to the object viewed if the highest perfection be sought.

READING GLASSES.

1. Reading glasses are useful in those conditions of vision where the size of the object is required to be enlarged.
2. One eye can only be employed with a reading glass at one time, for the employment of two eyes would cause the image to appear double.
3. The aged find reading glasses serviceable, and short-sighted persons derive advantage from the use of a reading glass in addition to their spectacles.

EYE GLASSES.

1. Single eye glasses are injurious because the work is thrown upon one eye.
2. Double hand glasses should always be employed in preference to spectacles by persons who, when engaged in conversation, have occasionally to view writing or small print.

OPERA GLASSES.

1. The opera glass is useful to give a clear view of a moderately distant object.
2. To have the stereoscopic effect a double opera glass should be used, which should be exactly adapted to the width of the eyes.

"*Smee on the Eye*"

Messrs. BLAND & LONG may here state that they adapt all spectacles to the various conditions of long and short sight by means of

SMEE'S OPTOMETER,

which effectually prevents injury to the eyes by the selection of improper glasses.

For the convenience of persons resident in the country, the "Optometer," together with full directions for use and a printed form, will be sent post free on receipt of a remittance for £1 1s. and upwards, which will entitle those remitting to a pair of spectacles of that value, when the Optometer and the form properly filled up shall be returned.

PANTOSCOPIC SPECTACLES.

This form of spectacles, from their being set at an angle on the face, enable the wearer to look over them at distant objects and through them at near ones, fulfilling all the conditions requisite for the assistance of long sight.

	Single.				Turnpin.		
	£	s.	d.		£	s.	d.
Best standard gold frames, with improved periscopic pebbles	3	10	0	—	4	4	0
Fine gold frames, with periscopic pebbles	2	15	0	—	3	3	0
Ditto, with glasses	2	7	6	—	2	15	6
Light gold frames, with periscopic glasses	1	10	0	—	1	15	0
Best silver frames, with periscopic pebbles	1	1	0	—	1	4	0
Ditto, with periscopic glasses	0	15	0	—	0	17	6
Ditto, lighter frames, with periscopic glasses	0	12	0	—	0	14	0
Blue steel frames, very light and strong, with periscopic pebbles	1	1	0	—	1	2	6
Do., stronger frame, with periscopic pebbles	0	12	6	—	0	13	6
Ditto, with periscopic glasses	0	7	0	—	0	8	0
Ditto, common, with double convex glasses	0	4	0	—	0	4	6

SPECTACLES OF ORDINARY SHAPE FOR LONG-SIGHTED VISION.

Best standard gold frames, with double convex pebbles	3	15	0	—	4	10	0
Ditto, with glasses	3	10	0	—	4	5	0
Fine gold frames, with double convex pebbles	2	15	0	—	3	3	0
Ditto, with glasses	2	10	0	—	2	18	0
Light gold frames, with best double convex glasses	1	10	0	—	1	15	0
Silver frames, with best double convex pebbles	0	17	6	—	1	0	0
Ditto, with best double convex glasses	0	12	0	—	0	14	0
Light silver frames, with glasses	0	10	0	—	0	12	0
Blue steel frames, of best make, light and strong, with double convex pebbles	0	18	6	—	1	1	0
Ditto, with double convex glasses	0	14	0	—	0	15	6
Ditto, stouter frames, with pebbles	0	14	0	—	0	15	6

	Single.			Turnpin.		
	£	s.	d.	£	s.	d.
Blue steel frames, very light, and best double convex glasses	0	10	6	0	12	6
Ditto, stouter frames and glasses	0	9	0	0	10	0
Ditto, inferior	0	6	0	0	7	0
Ditto, common	0	2	6	0	3	6
Tortoiseshell frames, with best double convex pebbles	0	17	0	0	18	6
Ditto, with best double convex glasses	0	10	6	0	12	0
Ditto, common, with glasses	0	8	6	0	10	0
Horn frames, with best double convex glasses	0	6	6	0	7	6
Ditto, common	0	2	6	0	3	6

Cataract spectacles, in every variety of mounting, 10s. to £1 1s.

SPECTACLES FOR SHORT SIGHT.

	£	s.	d.	£	s.	d.
Standard gold frames, with double concave pebbles	3	15	0	4	10	0
Ditto, with best double concave glasses	3	8	0	4	3	0
Fine gold frames, with best double concave pebbles	2	15	0	3	0	0
Ditto, with best double concave glasses	2	8	6	2	13	6
Light gold frames, with best double concave pebbles	1	16	0	2	2	0
Ditto, with glasses	1	10	0	1	16	0
Silver frames, with best double concave pebbles	0	17	6	1	0	0
Ditto, with best double concave glasses	0	13	0	0	15	0
Ditto, common	0	10	0	0	12	0
Blue steel frames, very light, with double concave pebbles, so grooved as to almost hide the frame	1	5	0	1	7	6
Ditto, with double concave glasses	0	18	0	1	0	0
Ditto, ordinary shape, very strong and light, with double concave pebbles	0	17	0	0	18	0
Ditto, with glasses	0	10	6	0	12	0
Ditto, stouter frames	0	8	0	0	9	0
Ditto, common	0	5	0	0	6	6

EYE PRESERVERS.

For protecting the eyes from too great an intensity of light, or from dust in railway or other mode of travelling. Particularly adapted for India and the tropics.

	Single.				Turnpin.		
	£	s.	d.		£	s.	d.
Blue steel frames, horse-shoe form and folding sides, with blue, grey, green, neutral tint, or plain white glasses—lightest and best quality . .	0	19	0	—	1	1	0
Ditto, stouter frames .	0	16	0	—	0	17	6
Ditto, common	0	10	6	—	0	12	6
Blue steel frames, ordinary shape, light and strong, with coloured glasses .	0	8	0	—	0	9	0
Ditto, common	0	5	0	—	0	6	0
Railway Preservers of best construction, allowing of free motion to the eyelashes and perfect ventilation to the eye, with full protection against dust, with glass in front and gauze sides, mounted in folding spectacle frame in neat leather case					1	10	0
Railway Preservers of wire gauze, with coloured or neutral tint glasses in centre, set in blue steel spectacle frame . . . . from 15s. to					1	1	0
Railway Preservers of wire gauze, with coloured or neutral tint glasses in centre, with elastic India-rubber band for passing round the head, best make, in leather case					0	12	0
Ditto, ordinary shape, in tin case					0	7	6
Ditto, all gauze					0	5	6
Ditto, common kind, with glass in centre, and tin box .					0	4	6
Ditto, all gauze.					0	3	6

HAND FOLDING SPECTACLES & DOUBLE EYE GLASSES.

Best gold folding hand Spectacles, in neat pearl case, with best pebbles .	from	3	10	0	to	6	6	0
Ditto, in tortoiseshell case . .	"	3	10	0	"	5	10	0
Fine gold ditto, in a variety of mountings,	from	2	10	0	"	3	10	0
Gilt ditto, with glasses . . .	"	0	15	0	"	2	2	0
Silver folding hand Spectacles, mounted with pebbles or glasses, in pearl cases,	from	1	10	0	"	2	10	0

	£ s. d.		£	s.	d.
Silver folding hand Spectacles, mounted with pebbles or glasses, in tortoiseshell cases . . . from	1 10 0	to	2	10	0
Best gold double Eye Glasses, opening with a spring, in a variety of patterns, with best double convex pebbles .	4 4 0	&	5	5	0
Gold double Eye Glasses, with or without spring, with best double convex pebbles	2 15 0	"	3	10	0
Ditto, with best double convex glasses,	£1 10s., £1 15s., £2 2s., £2 10s.	"	3	3	0
Silver double Eye Glasses, of different patterns, with best double convex pebbles,	£1 1s., £1 5s., £1 10s.	"	2	2	0
Ditto, with double convex glasses,	10s., 15s., £1 1s.	"	1	10	0
Tortoiseshell double Eye Glasses, of best make, with gold or steel spring bridge for holding on to the nose, glasses,	16s., 21s.	"	1	5	0
or with pebbles 6s. extra.					
Tortoiseshell double Eye Glasses, of ordinary make, with springs to hold on the nose, and best double convex glasses,	7s. 6d., 10s. 6d.	"	0	15	0
Ditto, common, without springs . .	5s.	"	0	6	6
Horn double Eye Glasses, with double convex glasses . .	1s. 6d., 2s. 6d.	"	0	5	0
Blue steel double Eye Glasses, of different shapes, spring noses, and best double convex glasses . . .	7s. 6d., 10s.	"	0	12	6
or with pebbles 6s. extra.					

SINGLE EYE GLASSES.

Gold single Eye Glasses,	each 10s., 12s., 15s., £1 1s., £1 5s	&	1	10	0
Silver single Eye Glasses,	each 5s., 6s., 7s. 6d., 10s.	"	0	12	0
Blue steel single Eye Glasses,	each 2s. 6d., 3s. 6d.	"	0	4	6
Tortoiseshell single Eye Glasses	" 2s. 6d., 3s. 6d.	"	0	4	6
Horn single Eye Glasses .	" 1s. 6d., 2s.	"	0	2	6

Spectacle and Eye Glass Cases, of various shapes, in leather, wood, metal, papier maché, tortoiseshell, &c., from 6d. to £1 1s.

READING GLASSES.

	£	s.	d.		£	s.	d.
Reading Glasses, in silver and pearl mountings	0	18	0	to	2	10	0
Ditto, in silver and tortoiseshell mountings	0	18	0	"	2	7	6
Ditto, mounted in tortoiseshell frame	0	10	0	"	1	1	0
Ditto, mounted in wood frame	0	5	6	"	1	1	0
Ditto, mounted in horn frame	0	3	6	"	0	10	0
Ditto, small, in horn frame & shut-up cases	0	3	6	"	0	7	6
Ditto, in tortoiseshell	0	5	0	"	0	12	6
Map Glasses, in ivory, horn, or circular wood frames	0	2	6	"	0	15	0

OPERA GLASSES.

	£	s.	d.
Small *single Opera*, black japanned body, 1 drawer, gilt tube	0	10	0
Ditto, ivory body, 1 drawer, gilt tube	0	12	0
Single Opera Glasses, in various mountings, from £1 1s. to	3	3	0
Binocular Opera Glasses, with Achromatic lenses, in every variety of plain or elegant mountings, from £1 15s. to	20	0	0
Diagonal Opera Glass, enabling persons to see at a short distance, either to the right or to the left, above or below, while apparently looking straight forward £6 6s. to	20	0	0
Small double Achromatic Opera Glasses, containing 12 glasses, and possessing as much power as the larger kinds, with a great diminution in size, from £3 3s. to	6	6	0

RACE OR TOURIST GLASSES.

No. 1. *Race Glass*, in leather sling case	4	4	0
No 2. Ditto, with sun shades	5	5	0
No. 3. Ditto, superior	6	6	0

These glasses are now made of such magnifying power that they are extensively used for naval and military purposes, and are invaluable to the sportsman in deer stalking.

TELESCOPES.

Perspective Glass, 1 drawer	0	1	6
Ditto ditto, 2 ditto	0	2	6
Ditto ditto, 3 ditto	0	3	6
Common Telescopes from 10s. 6d. to	1	1	0

ACHROMATIC TELESCOPES.

	£	s.	d.
Best portable Military Telescopes, 6 draw, closing to 3½ inches, bodies covered with whalebone, in brass .	1	10	0
Ditto, with extra power, useful for Astronomical purposes, brass stand, and packed in leather case . .	3	3	0
Best portable Military Telescope, 6 draw, closing to 3½ inches, body covered with whalebone, in German silver	2	2	0
Ditto, with extra power and brass stand, packed in leather case for the pocket	4	4	0
Best portable Military Telescope, 24 inches, 7 draw, closing to 5 inches, in brass	2	10	0
Ditto, in German silver	3	7	6
Best portable Military Telescope, 30 inches long, 8 draw, closing to 6 inches, whalebone body, in brass . .	3	10	0
Ditto, German silver	4	10	0
1 foot Telescopes, best make, 5 sliding tubes, closing to 5 inches, mahogany or rosewood body, object glass 1¼ inch aperture	1	15	0
1½ foot Telescope, best quality, 4 sliding tubes, closing to 6½ inches, mahogany or rosewood body, aperture of object glass 1½ inch	2	10	0
2 foot Telescope, best make, 4 sliding tubes, closing to 7½ inches, mahogany or rosewood body, object glass 1¾ inch aperture	3	10	0
3 foot Telescope, best make, 5 sliding tubes, closing to 10 inches, mahogany or rosewood body, object glass 2¼ inch aperture	6	6	0
Ditto, extra power, brass table stand, in mahogany case, £9 9s. and	10	10	0

For larger sizes, see section on "*Astronomical Instruments.*"

	£	s.	d.
1 foot 3 draw Telescope, best make, rosewood body, brass	1	12	6
Ditto, German silver	2	5	0
Ditto, ditto, with sun shade	2	7	6
1½ foot 3 draw Telescope, best make, rosewood body, brass	2	5	0
Ditto, German silver	2	17	6
Ditto, ditto, with sun shade	3	3	0
2 foot 3 draw Telescope, best make, rosewood body, brass	3	0	0
Ditto, German silver	4	0	0
Ditto, ditto, with sun shade	4	4	0

	£	s.	d.
2 foot 4 draw Telescope, best make, rosewood body, brass	3	3	0
Ditto, German silver	4	4	0
Ditto, ditto, with sun shade	4	7	6
2½ foot 4 draw Telescope, best make, mahogany or rosewood body, brass	4	4	0
Ditto, German silver, with sun shade	5	10	0
3 foot 5 draw Telescope, best make, mahogany or rosewood body, brass, with sun shade	5	10	0
Ditto, German silver	7	7	0

NAVAL TELESCOPES.

	£	s.	d.
Day or Night Telescopes, with Achromatic object glasses 2 feet focus, with sliding draw, £1 1s., £1 10s., £2 2s. &	3	3	0
Ditto, improved kind, with leather bodies, sling straps, and signal flags engraved on the body . £2 10s. to	5	5	0
Naval or Pilot Telescopes, with brass sliding tubes and shade opening to 3 feet	5	5	0
Ditto, 3½ feet	6	6	0
Night Telescopes . £2 2s. to	5	5	0

MICROSCOPES.

SIMPLE MICROSCOPES.

	£	s.	d.
Small Magnifying Lens, mounted in horn case for the pocket	0	1	0
Ditto, ditto, larger	0	2	0
Ditto, ditto, 2 powers	0	3	6
Ditto, ditto, 3 powers	0	4	6
Ditto, ditto, in tortoiseshell mounting . from 3s. to	0	12	6

This form of Microscope will be found extremely useful in mineralogical and botanical examinations.

	£	s.	d.
Botanical Microscopes, with pillar to screw to top of containing box . . . 10s. 6d., 15s. &	1	1	0
Small Seed Microscopes, with glass body, in case, 2s. to	0	5	0
Gardeners' Microscope, in case . 3s. 6d. &	0	5	0
Flower Microscopes . 3s. 6d. &	0	5	0

		£	s.	d.
Botanical Microscopes, with 3 powers	10s. 6d. &	0	15	0
Cloth Microscopes, or linen provers, for ascertaining the number of threads in a given area of linen cloth, in case	1s. 4d. &	0	2	0
Ditto, to fold for the waistcoat pocket, in German silver		0	5	6
Stanhope Lens, mounted in German silver	2s. 6d. &	0	3	6
Ditto, mounted in ivory	3s. 6d. &	0	5	0
Coddington Spherical Lens, in German silver or ivory mounting	3s. 6d. &	0	5	0
Ditto, in case, for pocket		0	7	6
Ditto, in silver	15s. &	1	1	0
Beetle Microscope	7s. 6d. &	0	10	6
Solar Microscope	£6 6s. to	21	0	0

This instrument is for exhibiting to a number of persons at the same time the magnified images of minute objects thrown on a screen.

COMPOUND MICROSCOPES.

		£	s.	d.
GOULD's *Improved Compound Microscope*, in case, with Apparatus complete		1	15	0
GOULD's *larger Compound Microscope*, with condenser and silver speculum for opaque objects		3	3	0
Ditto, with jointed stand, condenser, and speculum		5	5	0
Improved Compound Microscope, with vertical body, sliding eye-piece, rackwork adjustment, spring stage, concave mirror, six powers, reflector, hand magnifier, animalculæ box, glass and ivory disc, 24 objects, and other necessary Apparatus; forming a very complete instrument		2	10	0
Small Compound Microscope, with silvered glass, reflector powers, &c., in case	from 12s. to	1	5	0

ACHROMATIC MICROSCOPES.

	£	s.	d.
BLAND & LONG's *Anatomical Microscope*, magnifying power 7,000, consisting of a circular foot with jointed pillar to admit of the body of the instrument being placed in any position, set of Achromatic object glasses, condenser, forceps, test object, with fine rackwork adjustment to stage, the whole packed in a neat mahogany case	5	5	0

This instrument will be found invaluable to the student in microscopical science, and also to the medical man in the examination of blood and urine in health and disease.

	£	s.	d.
Anatomical Microscope, &c., larger, magnifying power 12,000, with fine adjustment	7	7	0
Ditto, very superior, with 2 sets of Achromatic powers, magnifying power from 1,000 to 25,000 times . .	10	10	0
Ditto, with extra eye-piece, 2 powers ½ inch and ¼ inch, extra Apparatus in case, forming a very complete instrument	15	15	0
Very superior *Compound Achromatic Microscope*, on steady tripod stand, with double joint for placing the body of the instrument at any required angle, double mirror, best moveable stage with double rackwork adjustments, fine adjustment, safety stage, diaphragms, 2 eye-pieces, 2 Achromatic object glasses, ¼ and ½ inch condenser for opaque objects on separate stand, animalculæ cell, forceps, live box, knives, test objects, &c., the whole carefully packed in mahogany case . .	25	0	0
Ditto, larger and more efficient instrument, with extra eye-piece and polarising Apparatus, complete . .	35	0	0

ACHROMATIC OBJECT GLASSES FOR MICROSCOPES.

In Brass Mountings, Boxes, &c.

2 inch	Object Glass,	magnifying power about	1,500 .	2	0	0
1 inch	"	"	8,000 .	2	5	0
½ inch	"	"	20,000 .	3	10	0
¼ inch	"	"	100,000 .	4	10	0
1-8th inch	"	"	500,000 .	6	6	0
1-16th inch	"	"	1,500,000 .	10	10	0

Triplet, of one-fortieth of an inch focus, for simple Microscopes	2	2	0
Doublet, of 1-30th of an inch focus	1	10	0
Ditto, 1-20th "	1	0	0
Ditto, 1-10th "	0	15	0
Single Lenses, from 1-10th to 1-80th of an inch focus, 10s. 6d. to	1	10	0
Ditto, ¼, ½, and 1 inch	0	5	0

APPARATUS FOR MICROSCOPES.

Silver Specula, for viewing opaque objects, from 7s. 6d. to	2	2	0
Glass Micrometers, very finely divided, for measuring diameters of magnified objects . from 5s to	0	10	0
Screw Micrometer	5	5	0

	£	s.	d.
Extra Eye-pieces, of different powers . . 10s. to	1	1	0
Micrometer Eye-piece	1	5	0
Condensing Lens, on pillar and foot, for the illumination of opaque objects . . . from 15s. to	1	10	0
Ditto, to attach to stage . . . . 5s. to	0	10	6
Polarizing Apparatus, adapted to Microscopes	2	2	0
Strips of Glass, with polished edges, for mounting objects . . . per doz.	0	1	0
Animalculæ Tubes, in box	0	3	6
Frog Plate, for showing the circulation of blood in frogs . . . 10s. 6d. &	0	15	0
Cases, for live Aquatic Insects	0	4	6
QUECKETT's *Forceps*, for taking hold of minute microscopic objects . brass, 10s. 6d., German silver,	0	15	0
Argand Lamp, of improved construction, for use with the Microscope, on brass sliding pillar, and with Achromatic glass	1	14	0
Strips of Glass, with polished oval cells . per doz.	0	3	6
Cut Rings . . . per doz. 2s. 6d. &	0	5	0
Ditto, squares . . . " 6s. to	0	10	0
Thin Microscopic Glass, cut in squares . per doz.	0	4	6
Ditto ditto circles . "	0	6	0
Canada Balsam, per ounce bottle	0	1	6
Camera Lucida, for sketching the magnified images of objects, in brass box	1	1	0
Set of Dissecting Instruments, for microscopic purposes, in case	1	1	0

MICROSCOPIC OBJECTS.

THE arrangement of objects for the Microscope adopted in the following list, is that set forth in "Queckett's Practical Treatise on the Microscope;" and it is hoped that it will be of service to those who are selecting particular classes of objects, by enabling them at once to refer to the head under which the objects—a few of which are here mentioned—are to be found.

Microscopic Objects prepared with the utmost care, and mounted in Canada Balsam.

Cuticles, of geranium, oncidium, oleander, each 1s. 6d. &	0	2	0
Silicious Cuticles. Equisetum, wheat, barley, rice or oat straw, malacca, bamboo or rattan canes, each 1s. 6d. &	0	2	0

	£	s.	d.
Cellular Tissue. Section of pith of elder, pine, rice paper plant, rush, pulp of orange, strawberry, &c., 1s. 6d. &	0	2	0
Fibro-Cellular Tissue. Oncidium, pumilum, sphagnum, pleurothallis, augustifolia each 2s. &	0	2	6
Hairs of Leaves or Flowers. Anchusa augustifolia, elœagnus augustifolia, verbascum each	0	2	0
Colouring Matter, in cuticle of balsam, rhubarb, &c. each 1s. 6d. &	0	2	0
Starch. Arrowroot, sago, tapioca, iceland moss, potatoe, rice, wheat, &c. 1s. 6d. &	0	2	0
Ducts, of rhubarb, dahlia, &c. each 1s. 6d. &	0	2	0
Spiral Vessels, of asparagus, hyacinth, lycopodium, rhubarb, &c. 1s. 6d. &	0	2	0
Raphides, in the elm, hickory, aloe, &c. each 1s. 6d. &	0	2	0
Woody Fibre. Flax, hemp, cedar, date, palm, pine, oak, mahogany, elm, cane, fir, larch, sea ash, &c., in sections each	0	2	0
Fossil Woods, endogenous and exogenous, from Antigua, Honduras, Australia, Van Diemen's Land, Egypt, &c. each	0	2	0
Stones of Fruit, in sections. Tamarind, plum, apricot, cherry, &c. each	0	2	0
Shells of Nuts. Cocoa and hazel nuts, walnut, &c. each	0	2	0
-*Seeds,* of dandelion, poppy, verbena, sycamore, eremocarpus, &c. each 1s. 6d. &	0	2	0
Pollen. Jasmine, tulip, tiger lilly each 1s. 6d. &	0	2	0
Fibrous Structures. Flax, hemp, cotton, silk, gun-cotton, wool, hair, &c. each 1s. 6d. &	0	2	0
Infusoria (recent). Thames, Algoa Bay, Tyne, Clyde, Lea, Indus, &c. each 1s. 6d. &	0	2	0
Infusoria (fossil). Springfield (Barbadoes), Lapland, Tripoli, New Zealand, Richmond (North America), each 1s. 6d. &	0	2	0
Spiculæ in sponges each 1s. 6d. &	0	2	0
Gemmules in sponges each 1s. 6d. &	0	2	0
Alcyonium, gorgonia, zoophytes, corals, each 1s. 6d. &	0	2	0
Antennæ, of gnat, cockroach, privethawk moth, tiger moth, &c. each 1s. 6d. &	0	2	0
Elytra. Cockchafer, dermestes, diamond, musk, and rose beetles, &c. each 1s. 6d &	0	2	0

	£	s.	d.
Eggs. Ichneumon fly, cockroach, blowfly, spider, silkworm, &c. . . . each 1s. 6d. &	0	2	0
Feet of Insects. Flies, spider, hornet, blowfly, wasp, ophion, ichneumon . . . each 1s. 6d. &	0	2	0
Eye of bee, butterfly, housefly, spider, shrimp, cricket, &c. each 1s. 6d. &	0	2	0
Hairs of Insects. Bee, spider, dermestes, larva, diamond beetle, gnat wing . . each 1s. 6d. &	0	2	0
Ditto, sea mouse, crab's claw, lobster's tail, &c. each 1s. 6d. &	0	2	0
Probosces and Jaws of bee, beetle, fly, cricket, butterfly, spider, wasp, saw fly, flea, gnat, boat fly, asylus fly, locust, &c. . . each 1s. 6d. &	0	2	0
Parasites of dog, ox, sheep, different birds, &c. each 1s. 6d. &	0	2	0
Test Objects. Scales of podura plumbea, lepisma saccharina, morpho menelaus, papilio Paris, pontia Brassica, hair of bat, mouse, larva of dermestes, each 1s. 6d. &	0	2	0
Navicula. Angulata, Spenceri and hippo-campus, each	0	2	0
Tracheæ. Larva of dyticus, cockchafer, silkworm, blowfly each 1s. 6d. &	0	2	0
Spiracles. Wasp, larva of blowfly, bee, cockchafer, and centipede . . . each 1s. 6d. &	0	2	0
Stings of hornet, bee, ichneumon fly, &c. each 1s. 6d. &	0	2	0
Stomachs of wasp, cricket, cockroach, bee, blowfly, &c. each 1s. 6d. &	0	2	0
Blood Corpuscles. Human, elephant, mouse, newt, crocodile, ostrich, fowl, salmon, perch, &c. each 2s. &	0	2	6
Sections of Teeth (longitudinal or transverse). Human, horse, sheep, elephant, cat, dog, bear, crocodile, shark, pike, &c. . . . . . each 2s. &	0	2	6
Sections of Bone (transverse or longitudinal). Human (adult and fœtal), horse, elephant, stag, ox, fowl, ostrich, shark, sword fish, &c. each 2s. &	0	2	6
Shells. Echinus spine and shell, cuttle bone, prawn, shrimp, crab, &c. . . . each 1s. 6d. &	0	2	0
Shells from guano, &c. . . each 1s. 6d. &	0	2	0
Hair. Human (adult and fœtal), Indian bat, dormouse, elephant, &c. . . each 1s. 6d. &	0	2	0
Horn of antelope, rhinosceros, ox, &c. each 1s. 6d. &	0	2	0

	£	s.	d.
Hoof of horse, elephant, rhinosceros, sheep, &c. each 1s. 6d. &	0	2	0
Quill of goose, turkey, eagle, duck, &c. each 1s. 6d. &	0	2	0
Whalebone, section of	0	2	0
Muscular fibre. Dyticus, frog, fowl, newt, human, cricket, &c. each	0	2	6
Injections of Gall Bladder. Cat, human, sheep, ox, &c. each	0	2	6
Injections of Intestine. Alligator, boa constrictor, cat, dog, duck, fowl, human (adult and fœtal) horse, newt, sheep, pig, &c. each	0	2	6
Injections of Lungs. Boa constrictor, cat, dog, human (adult and fœtal), kitten, horse, sheep, &c. each	0	2	6
Injections of Kidney. Dog, cat, human, rabbit, sheep, fowl, horse, &c. each	0	2	6
Injections of Stomach of cat, dog, sheep, snake, human (adult and fœtal), pig, rat, &c. each	0	2	6
Injections of Liver of cat, dog, rabbit, sheep, fowl, rat, &c. each	0	2	6
Muscle—Frog, human, pig, &c. each	0	2	6
Cartilage—Human, pig, calf, &c. each	0	2	6
Urinary Deposits.—Phosphates, Urate of Ammonia, Uric Acid (Infant Calculi), Lithic Acid, Spermatozoa, Cystic Oxide (natural deposit), Carbonate of Lime, Hippuric Acid, Urea, Sugar from Diabetes, Oxalate of Lime (Dumb-bell), Oxalate of Lime (Ellipsoidal); Set of 12, in case	1	5	0
Or separately each	0	2	0
Polarizing Objects—consisting of Hoofs of Animals—camel, horse, ox, sheep, &c.; Horns of rhinosceros, antelope, sheep, &c.; quills of porcupine, &c.; human tendon; scales of fishes—eel, sole, &c.; human skin, whalebone, various kinds of starch, hairs from leaves, Deutzia Elœagnus, &c.			
Siliceous Cuticle of equisetum, rice, wheat, bamboo, raw silk, cotton, flax, gun cotton. *Crystals* of various salts each	0	2	0
Films of Selenite for use with the same each	0	2	0
Sections of *Fossil Woods*, cut in three directions (Exogenous) each	0	4	6
Ditto (Endogenous) each	0	3	6
Ditto of Flint, containing "Xanthidiæ" each	0	2	0

	£	s.	d.
Sections of Oolites . . . . each	0	2	0
Set of 6 Glass Slides, containing 18 sections of woods of oak, elm, ash, beech, willow, horse chesnut . in case	0	10	6
Set of 12 Slides, containing 36 sections, each slide showing 3 different cuttings	1	0	0
Set of 6 Test Objects—Podura, Menelaus, brassica, hair of mouse and indian bat, and Navicula hippocampus, in case	0	12	6
Set of 40 Slides of popular objects, suited for a common Microscope, in case, named	0	7	6

OXY-HYDROGEN MICROSCOPES AND APPARATUS.

Messrs. Bland and Long, in submitting the following account of the Oxy-hydrogen Microscope as supplied by them, would take this opportunity of suggesting to Lecturers, Schoolmasters, and Amateurs in Science, that this form combines many advantages not usually found in such instruments—such as portability, ease in management, and above all, a most powerful and efficient light, enabling the most minute objects to be magnified many thousand times, when thrown upon a screen or whitened wall. To the Lecturer this Apparatus is invaluable, enabling him to exhibit some of the most interesting phenomena connected with animal and vegetable physiology to a large audience, or for the purpose of illuminating Diagrams and other illustrations to the Lecture.

To the Chemist another use of this Apparatus suggests itself, in various operations in the laboratory where intense heat and light are required in a short space of time.

From the fact of the gases being enclosed in separate vessels, all danger is obviated.

The gas-bags are of sufficient size to allow of the apparatus being used for one hour without interruption.

	£	s.	d.
Bland & Long's Oxy-hydrogen Microscope, with 3-inch Condensers, complete, in mahogany case, with Water Trough for animalculæ, decomposition of water, &c., and furnished with three powers of different degrees—one for showing large objects, such as leaves, whole insects, flowers, &c.; another for showing animalculæ in water, &c.; and a third for showing very small objects, such as eels in paste, &c.	15	15	0

	£	s.	d.
Bland & Long's Improved Oxy-Hydrogen Microscope, with 3-inch Condensors, Gas Apparatus, &c., complete, consisting of Mahogany Lantern with japanned tin cover, mounted on a mahogany board, supported on a strong and portable tripod stand. The Microscope is adapted to one side of the lantern, and the Apparatus, with every adjustment for the regulation of the light, is placed within the same. The two stout Caoutchouc or India-rubber Gas-bags for containing the gases, mounted with brass stopcocks and unions, are placed between 2 strong pressure boards, with hinges and folding flaps, on which the weights are to be placed. Connexion is made between the Gas-bags and the Lime Burner, by means of two 10-feet lengths of Vulcanized India-rubber Tubing, with brass unions and fittings. The Apparatus for the generation of the Gases consists of a leaden vessel and purifier for the Hydrogen, and an iron Retort, &c., for the Oxygen, with all the necessary fittings complete. The highest magnifying power of this instrument is about two million times.			
The whole of the above Apparatus of best workmanship	35	0	0
The above Apparatus, complete on a larger scale, suitable for Public Institutions, large Scholastic Establishments, &c. . . . . . £45, £60, and	100	0	0
Transparent or Opaque Screens for the above £1 10s. to	3	10	0
Ditto ditto mounted on portable frame £2 10s. to	6	6	0
Clockwork Movement, for keeping the Lime Cylinder in revolution during combustion, as supplied in the larger instruments	5	5	0
India Rubber or Caoutchouc Cloth Gas bags, for holding the Gases, with stopcocks and union joints (see page 11) each . . . from £1 15s. 6d. to	6	0	0
Pressure Boards, with stout hinges, folding flap for holding the weight, from	1	10	0
Lime Cylinders, in sealed bottles, per doz., common, 3s. 6d., best,	0	5	6
Leaden Bottle Gas Generator, with Purifier, for *Hydrogen Gas* . . . . . . £2 2s. to	4	4	0
Iron Retort for the generation of *Oxygen Gas*, with Purifier and Connections . . . 18s. and	1	5	0
Glass Water Troughs for exhibiting animalculæ, and also for showing the decomposition of water, each .	0	5	0

	£	s.	d.
Apparatus for exhibiting in the Gas Microscope the formation of the *Magnetic Curves*, by sifting iron filings on to the poles of a small horse-shoe Magnet 5s. 6d. and	0	8	6
An assortment of Objects, mounted in Balsam, for exhibiting with the Oxy-hydrogen Microscope, consisting of Insects, parts of Insects—such as antennæ, legs, bronchial tubes; dissections of the tracheæ, wings, wing cases, tongues, stings, eyes; scales of butterflies and moths; fuci, mosses and ferns, zoophytes, madrapores; sections of recent and fossil woods, showing the cellular structure, medullary rays, glands, pith, &c., leaves, feathers, each slider 2s. to	0	5	0

PHANTASMAGORIA & MAGIC LANTERNS, SLIDES, &c.

Magic Lanterns of improved construction, for the exhibition of subjects in Natural History, Astronomy, Comic Subjects, Portraits, Costumes of different Nations, and a vast variety of other interesting subjects.

The interest attached to the exhibition of the Magic Lantern, is too well appreciated to need comment. We may here remark, that from the peculiar arrangement of the Lenses in the Lanterns described below, a much larger amount of light is obtained on the screen, and the pictures produced are free from that indistinctness at the edges, so common with instruments of ordinary construction.

		£	s.	d.
No. 1.	Lantern, with 12 Comic Sliders	0	10	0
	Ditto, without Sliders	0	5	0
No. 2.	Ditto, with 12 Sliders	0	15	0
	Ditto, without Sliders	0	8	0
No. 3.	Ditto, with 12 Sliders	1	4	0
	Ditto, without Sliders	0	12	0
No. 4.	Ditto, with 12 Sliders	1	15	0
	Ditto, without Sliders	0	15	0
No. 5.	Ditto, with 12 Sliders	2	3	0
	Ditto, without Sliders	0	19	0
No. 6.	Ditto, with 12 Sliders	5	10	0
	Ditto, without Sliders	3	10	0

	£	s.	d.
Bland & Long's Improved Lantern, with Microscope attached, for showing leaves, feathers, sea weed, water insects, &c., complete, consisting of two Condensing Lenses, in brass mountings, brass front with sliding tube for adjustment of focus, Argand Lamp, &c., capable of throwing a clear disc of 10 feet in diameter, with all necessary Apparatus, packed in case	5	5	0
Ditto, without Microscope or Objects	3	10	0
Ditto ditto larger £5 5s. and	7	7	0
Large size *Comic Sliders*, after various designs, per doz.	4	4	0
17-inch *Comic Slides*, in box "	2	8	0
14-inch ditto " "	1	17	6
12-inch ditto " "	1	4	0
10-inch ditto " "	1	0	0
8-inch ditto " "	0	12	0
8-inch ditto, paper edges "	0	7	0
6-inch ditto " "	0	5	0
Lever Slides each	0	10	6
Comic Slip Sliders in great variety each 3s., 4s. and	0	5	0
Series of *Astronomical Diagrams*, consisting of telescopic views of the Moon, Planets, Comets, &c., for illustrating in a most pleasing and instructive manner, the science of *Astronomy*.			
No. 1. Small size, in box	2	2	0
No. 2. Ditto, with 3 or 4 Diagrams on each slide	3	3	0
No. 3. Each Diagram 3 inches diameter	4	4	0
No. 4. Large size, in case, with book, complete, consisting of 37 Diagrams, each painted on a separate circle of glass, 3½ inches in diameter	6	6	0
Series of *Ten Moveable Astronomical Slides*, with superior rack and pinion movement, by which the magnified images of the objects may be made to revolve, forming a most complete set for the use of the Lecturer or Schoolmaster; the whole packed securely in mahogany case, with lock and key	9	9	0
Small size ditto	6	6	0
Set of *Astronomical Slides*, painted with extra care, for exhibition with the Oxy-hydrogen Light, consisting of 37 Diagrams, plain and moveable, in case, with lock and key, suitable for a Public Institution £9 9s. &	15	15	0
Ditto ditto larger size £15 15s. &	21	0	0

	£	s.	d.
Set of Slides representing objects in *Natural History*, such as birds, reptiles, fishes, insects, &c. £2 2s., £3 3s. &	4	4	0
Geological Slides, showing the structure of the earth's crust, with figures of fossils	3	3	0
Set of Sliders of *Ancient and Modern Costumes* . .	3	3	0
Ditto of *Scripture Subjects*, from various illustrated Bibles . . . . .. £2 15s. to	6	6	0
Ditto, Manners and Customs of the Chinese . .	3	3	0
Ditto of Conchology and Botany, 14 diagrams . .	4	4	0
Portraits of celebrated Individuals . . each	0	10	0
Views in Italy, France, India, England, &c. . 5s. to	0	10	0
Set of *Artificial or Chinese Fireworks*, with 12 subjects, in case . . . . £1 10s. &	2	2	0
Lever Moveable Slides of Shipping . . 10s. &	0	12	0

Single Slides, or series of Slides, for illustrating any particular subject, such as Travels, Bible History, &c., painted to order.

DISSOLVING VIEWS.

Improved Apparatus for showing the Dissolving Views, as exhibited at the Public Institutions in London.

The peculiar beauty of this arrangement consists in the pleasing effect produced by the merging of one view into another of quite a distinct character, so imperceptibly, and in so gradual a manner, that the eye cannot detect where one picture commences and the other vanishes.

	£	s.	d.
No. 1. Dissolving View Apparatus, illuminated with the Oxy-hydrogen lime Light, consisting of 2 mahogany Lanterns, with Condensing Lenses of 4 inches diameter, handsome brass fronts, adjusting tubes and spring slide holders, two improved safety Oxy-hydrogen jets and lime-holders, vulcanized India-rubber Connecting Tubes, with brass stopcocks, unions and ferrules; 2 Caoutchouc Gas-bags, with pressure boards and weights; Hydrogen Generator and Purifier, Iron Retort for Oxygen; the whole mounted on mahogany board with folding tripod legs, and capable of throwing a disc of intense light 20 feet in diameter, complete	42	0	0

		£	s.	d.
No. 2. Dissolving View Apparatus, &c., with 6-inch Condensers		60	0	0
No. 3. Ditto, 9-inch ditto		85	0	0

Larger sizes made to order.

Messrs. Bland & Long would take occasion to mention, that from the simplicity of the parts of the above splendid Apparatus, no difficulty will be experienced in its complete management, even in the hands of the uninitiated.

Dissolving View Apparatus, illuminated with powerful Argand lamps, capable of showing a disc of 10 feet diameter, and admirably adapted for schools or private families	£8 8s. &	10	10	0
Ditto, smaller		7	7	0

SLIDES FOR DISSOLVING VIEWS.

Owing to the intense illuminating power of the oxyhydrogen light, and the size to which the pictures are magnified, it is essential that the greatest care should be exercised in the painting of slides intended for exhibition as Dissolving Views, the price of the same varying in proportion to the detail in the picture. Any subject or series of incidents painted to order in the best manner, such as a series of pictures illustrating the Overland Route to India, Landscapes in Summer and Winter, Volcanic Mountains at rest and in eruption, &c. &c.

		£	s.	d.
Dissolving View Slides for No. 1 Apparatus, painted in the first style	each from £1 1s. to	3	3	0
Ditto No. 2 Apparatus	each from £2 2s. to	5	5	0
Ditto No. 3 Apparatus	each from £2 10s. to	10	10	0
Ditto for small Apparatus	5s., 10s. 6d. to	1	5	0
Panoramic Scenes for Dissolving Views, illustrating a continuation of scenery, such as the Banks of the Rhine, &c.; also, fixed scenes with moving figures, as a viaduct with a train passing over it, vessels at sea, &c. &c.	£3 13s. 6d. to	20	0	0
Set of *Astronomical Slides*, with rackwork motion, illustrating the various theories in *Astronomy*. For No. 1 Apparatus	£9 9s. &	15	15	0
Ditto, for No. 2 Apparatus	£15 15s. to	21	0	0
Ditto, for No. 3 Apparatus	£16 to	30	0	0
Comic Slip Slides, &c.	from 10s. to	3	3	0

CHROMATROPES.

These highly amusing and interesting slides consist of two circular discs, painted in various manners, and caused to revolve in opposite directions with different degrees of rapidity. The change is truly surprising, and forms an excellent finale to the exhibition of Dissolving Views.

		£	s.	d.
Chromatrope Slides, small size	10s. &	0	15	0
Ditto, larger	17s. 6d. to	2	2	0
Oxy-hydrogen Microscope, fitted to No. 1 Dissolving View Apparatus		15	15	0
Ditto, No. 2 ditto		25	0	0
Ditto, No. 3 ditto		40	0	0

OPAQUE MICROSCOPE AND PHYSIOSCOPE.

BY this instrument we are enabled to exhibit in the most pleasing manner magnified images of opaque objects, such as plaster casts, cameos, flowers, &c. &c., in their natural colour. Small animals, such as mice, birds, &c., can also be exhibited, as likewise the human face, magnified some 200 times its natural size.

		£	s.	d.
Price of *Opaque Microscope* complete, to adapt to Dissolving View Apparatus . .	£10 10s. to	20	0	0
Ditto *Physioscope* combined . . .	£15 to	25	0	0

POLARIZED LIGHT.

Apparatus for illustrating the polarization, diffraction, and interference of Light.

GAS POLARISCOPE.

Improved Oxy-hydrogen Polariscope, with condensing lenses, powers, polarizing and analysing bundle of thin crown glass, two spring stages for holding selenite sliders and plates of crystals, double image prism, with selenite slide to show the recomposition of white light by the overlapping of complementary colours, tourmaline for showing the beautiful rings in crystals, mounted in brass with triple horizontal movement and rack adjustment, and possessing every facility for cleaning and arranging the different parts, in mahogany case	15	15	0
Ditto, with lantern and tripod stand	21	0	0
Ditto, with all necessary Apparatus for generating and burning the mixed gases, exclusive of objects	31	0	0
Ditto, larger sizes £40 to	60	0	0
Polariscope, adapted to the condensing lenses of the *Gas Microscope* from	8	8	0
Tourmaline Polariscope, mounted in brass, with a means of adjusting the axes of the tourmaline plates while viewing the systems of coloured rings in crystals, £2 2s. &	3	3	0
Very superior Tourmaline Polariscope, in wood frame, with a series of crystals arranged round a revolving disc, so that each may be in its turn brought between the plates of tourmaline, both of which have proper motions £3 3s. &	4	4	0
Simplest form of *Tourmaline Polariscope*, consisting of two plates of the crystal arranged in forceps, with means of introducing the objects between them, 10s. &	1	1	0
Tourmaline Polarizing Apparatus, to illustrate the phenomena produced by the combination of coloured rings from two polished crystalline plates, and the interposition of certain crystalline films between them	2	12	6

In this arrangement one plate has a double vertical motion, and the

other a universal motion, by which means not only the obliquity of the axis in the plane of their sections, but any obliquity may be effected in the crystals.

	£	s.	d.
Le Count's Polariscope, consisting of a horizontal plane reflecting mirror, on which the object to be examined is laid, and a bundle of thin glass, which serves for both polarizing and analysing plates. Many instructive experiments in polarization can be made with this instrument . . . . . 15s. to	1	10	0
Portable Reflecting Polariscope, consisting of black mirror, and a mahogany roof with glass slides, so arranged that objects may be placed at the proper polarizing angle	1	5	0

The addition of a grey glass renders this form of instrument suitable for exhibiting the effects by lamplight.

	£	s.	d.
BIOT'S *Reflecting Polariscope*, consisting of polarizing and analysing bundles of thin glass, mounted on brass supports, with every means of adjustment, horizontal motion on graduated circle, stage for objects, &c.	3	3	0
Spring Stages for the above, used with one mirror, and tourmaline for crystals	0	5	6
Tourmaline Cell, for ditto . . . 10s. 6d. &	1	1	0
Double Image Prism, with selenite disc of equal thickness for exhibiting the recomposition of white light by the overlapping of the complementary colours .	0	9	0
Ditto, arranged for *Gas Polariscope*	0	12	0
Brass Frame, for showing the polarizing structure; communicated to a piece of annealed glass by unequal pressure	0	5	0
Apparatus, to show the same effect by the unequal application of heat	0	5	0
Polished Plates of Tourmaline, for observing the phenomena of polarized light, in brass and wood mountings . 2s. 6d., 5s. 6d., 7s. 6d., £1 1s. to	5	0	0
NICOL'S *Single Image Calc-spar Prism*, for the polarization of light . . . . 12s., 15s. &	1	5	0
Polarizing Eye-piece, consisting of a bundle of thin glass, fitted in case for pocket . . 4s. 6d. &	0	6	6
Bundles of very thin glass, arranged for experiments, in polarized light . . . . . 10s. to	1	1	0

OBJECTS FOR THE POLARISCOPE.

	£	s.	d.
Objects mounted for the Oxy-hydrogen Polariscope, comprising plates of carbonate of lime, sulphate of baryta, amethyst, borax, rochelle salts, brazilian topaz, arragonite, nitre, beryl, &c., cut perpendicularly to their axes, showing the splendid systems of rings produced by these bodies on polarized light, each 5s. to	0	10	0
Selenite Objects, mounted in mahogany frames, with rack and pinion movement for the Oxy-hydrogen Polariscope . . . . . . £1 1s. to	3	3	0
Selenite Objects, mounted in mahogany frames, comprising the following designs:—			
Design in *Selenite* of the pansy, with motto on coloured ribbon, "Heart's-ease"	1	1	0
Ditto of thistle, in Selenite, with motto "Dinna forget"	0	15	0
Ditto of shamrock, with coloured ribbon and motto "Erin-go-Bragh"	0	15	0
Ditto, ditto, "Forget me not"	0	15	0
Selenite Star, of 6 compartments	0	8	0
Ditto Rosette, of 5 pieces	0	10	0
Ditto ditto, 6 pieces	0	14	0
Ditto ditto, Superposing Star, of 16 divisions . .	0	14	6
Ditto ditto, "Maltese cross"	0	10	0
Selenite Wedge, for showing the Newtonian coloured rings	0	10	0
Double Selenite Wedge, with bases joined for same experiment	0	10	0
Chameleon, in Selenite . . . . . 15s. &	1	10	0
Dolphin, in ditto	0	15	0
Parrot, in ditto . . . . 15s. &	1	10	0
Butterfly, in ditto . . . . . . 15s. &	1	1	0
Selenite figure of *Harlequin* . . . . £2 &	3	3	0
Ditto of *Caspar* . . . . . . £1 18s &	2	15	0
Ditto of *Robin Hood* . . . . . £1 10s. &	2	15	0
Ditto of *Jim Crow* (black and white) . £1 16s. &	3	3	0
Ditto of *Gothic Window* . . . . £1 16s. to	10	10	0

		£	s.	d.
Specimens of polished *unannealed glass*, of different figures, showing the peculiar polarizing structure of glass that has been uniformly heated and suddenly cooled	each	0	4	6
Set of 6 of the above, mounted in mahogany frames .		1	7	0
Sections of *Quill*, for showing its polarizing structure .		0	3	0
Plates of polished *Quartz*, of different thicknesses, to exhibit the change in the phenomena due to the different thicknesses of the plates . .	5s. &	0	7	6
Pair of thick polished plates, of *right and left-handed Quartz*, to show the dichroism turned on the right and on the left hand by the direction of rotation of the analysing plate				

Homogeneous light should be used in analysing this remarkable property of the two peculiar crystals.

		£	s.	d.
A pair of very thin wedges of sulphate of lime, for illustrating the coloured fringes parallel to their edges, thus showing the various tints produced by different thicknesses of the crystal, mounted in frame, with rackwork motion . . .		1	1	0
Selenite Discs, of uniform thickness, mounted in frame with pulley and band to rotate	7s. 6d. to	1	10	0

This arrangement greatly increases the variations of the colours of Selenite designs, crystals, and other polarizing objects, when used in the Polariscope.

		£	s.	d.
Plates of Calc-spar, with natural figure and polished surfaces to see the parallel fringes in homogeneous light when placed between two plates of Tourmaline,	5s. &	0	7	6
Two plates of *Calc-spar*, placed across to show the parallel fringes with common light when viewed between two Tourmaline plates		0	10	0
Plates of *Nitre*, with four axes		0	5	0
Ditto ditto, with two axes		0	5	0
Ditto *Quartz* (right and left-handed) . . .	3s. &	0	7	6
Ditto *Calc-spar*	2s. &	0	4	0
Ditto *Topaz*		0	6	0
Analysing Tourmaline Plate, mounted in brass cap to fit on the front of *Gas Polariscope* .	7s. 6d. &	1	10	0
Rhombs of Iceland Spar	2s. to	1	15	0

		£	s.	d.
Achromatic Compound Prism, of Calc-spar and glass, mounted in brass case, exhibiting in a most marked manner the phenomena of *double refraction*	12s. &	0	15	0
Double Refracting Quartz Prism	10s. &	0	16	0
Specimens of *Iceland Spar*, to show the multiplication of images afforded by the peculiar structure of the crystal when looked through at a lighted candle in a darkened room . . .	5s. to	0	7	6
Concave and Convex Plates of Selenite, for exhibiting coloured concentric rings				
Mounted Polarizing *Agate Plates* .		0	5	0

Every description of Apparatus for experiments in *Polarized Light* made to order.

		£	s.	d.
Wheatstone's Polar Clock, for showing the hour of the day by the polarizing power of the atmosphere .		2	12	6
Ditto, smaller, suitable for the pocket, with all necessary adjustments, compass, &c., complete		2	12	6
Apparatus, for showing the circular polarization of fluids	£3 3s. &	5	5	0

DIFFRACTION.

	£	s.	d.
Barton's Iris Buttons, to illustrate the prismatic and iridescent appearance of white light reflected from grooved surfaces	0	7	0
Read's Iriscope, consisting of a black polished mirror, with its surface covered with a thin layer of soap, which when breathed upon through a glass tube, exhibits a series of coloured rings by the vapour deposited	0	10	0
Prisms with very obtuse angles for the interference of light	0	5	0
Ditto, with equal angles, mounted on plane silvered reflecting mirrors, for illustrating the interference of light			
Apparatus for examining the coloured fringes formed in the shadows of bodies by diffraction, when placed in the light diverging from a luminous point, in case, complete, with telescope, &c.	2	12	6

	£	s.	d.
Microscopic Apparatus, for investigating the phenomena of *conical refraction* at the optic axes of bi-axial crystals, fitted with crystals of *Arragonite*, in case, complete	1	11	6

CAMERAS, PRISMS, MIRRORS, &c.

	£	s.	d.
Amici's *Camera Lucida*, in case	2	8	0
Wollaston's ditto, for drawing objects in true perspective, in case for pocket	1	10	0
Portable Drawing Board, on Tripod Stand for ditto £1 1s. &	2	2	0
Portable *Field Camera*, for sketching from Nature £3 3s. to	6	6	0
Fittings complete for large Garden or House Cameras, from	5	5	0
Photographic Cameras—*See* Section on Photography.			
Apparatus for showing Newton's Coloured Rings .	0	10	0
Black Mirrors, for Landscape Sketching, in cases, from 7s. 6d to	2	2	0
Claude Lorraine Glasses 2s. 6d. to	0	15	0
Optical Diagonal Machines, for viewing perspective prints . . . . . . £1 10s. and	2	12	6

Concave and Convex Mirrors, in wood frames:—

	£	s.	d.		£	s.	d.
4 inches diameter	0	10	6	5 inches diameter	0	14	0
6 "	0	16	0	7 "	1	1	0
8 "	1	10	0	9 "	1	15	0
10 "	2	2	0	12 "	2	12	6
15 "	5	5	0	18 "	6	16	6
21 "	9	9	0	24 "	12	12	0
28 "	21	0	0	30 "	31	10	0

	£	s.	d.
Phantascope, elucidating one of the many illusions effected by the *Concave Mirror* projecting figures in air, price varying with diameter of the Mirror; above 12 inches diameter	3	3	0
Brewster's *Kaleidoscope*, with 2 reflecting planes placed at certain angles, producing a circular field of vision . . . . 8s., 15s. and	1	1	0

	£	s.	d.
Polemoscope, for showing an apparent impossibility, by means of which an object may be distinctly seen, though an opaque body be placed before it 12s. &	1	10	0
Cylindrical, *Prismatical*, *Pyramidical*, and *Conical Mirrors*, for showing the peculiar properties of their several forms.			
Multiplying Glasses . . . . . 2s. 6d., 5s. &	0	7	6
WHEATSTONE's *Photometer*, for measuring the intensity of light by the reflection from a silvered bead in a state of rapid revolution . . . £1 1s. &	1	16	0
RITCHIE's *Photometer*, for comparing the intensity of two lights, by means of the reflected images of the two luminous bodies . . . . . £1 1s. &	2	2	0
LESLIE's *Photometer*.—This instrument is a modification of the Differential Thermometer, one of the bulbs being formed of black glass enamel £1 10s. &	3	3	0
Photometer, consisting of a wedge of black glass, mounted in frame and case, with a slit for admitting the rays of light, a rackwork movement is applied to the wedge, and also graduations for reading off the intensity of light, of which the eye is the judge 15s to	4	4	0
Prismatic Plane, for showing the re-composition of white light, by the rapid revolutions of the plane on its axis . . . . 10s. 6d. to	1	5	0
Prisms of flint glass, for the decomposition of white light . . . . . 1s. 6d., 2s. 6d., 3s. 6d. to	0	10	6
Ditto, mounted on brass stands, with ball and socket joint . . . . . 7s. 6d., 12s., 15s. and	1	1	0
Achromatic Telescope for viewing Fraünhofer's dark lines by artificial light . . . . £6 6s. and	7	7	0
Lantern, with adjustable brass slit, Solar Lamp, Stoppered Bottle for containing gaseous products, to be used in conjunction with the above	3	3	0
Hollow Glass Prism, for experimenting on the refraction of various liquids . . 15s., £1 1s. and	1	10	0
Ditto, on brass stand . . . . . £1 1s. and	2	2	0

STEREOSCOPES—*See* Section on PHOTOGRAPHY.

OPTICAL MODELS.

	£	s.	d.
Model to illustrate the decomposition of white light by the Prism into coloured rays. This apparatus consists of a Prism of glass, and the rays are represented by coloured silken threads . . £1 1s. and	1	11	6
Set of three Optical Models, with the supposed path of the rays of light represented by silken threads, to illustrate the principles of the Solar Compound and Simple Microscopes . . . £3 3s. and	4	4	0
Set of two Models to illustrate the principles of Optics in the relation to the construction of Reflecting and Refracting Telescopes . . . £3 3s. and	4	4	0
Set of three Models to illustrate the nature of Vision, and the peculiar phenomena attendant on long and short sight . . . . . . £3 13s. 6d. and	5	5	0
Apparatus to illustrate that the intensity of light varies inversely as the square of the distance. It consists of a mahogany vertical plane, with a small aperture in the centre, through which the light passes, and is received on a muslin screen arranged parallel to the plane of the aperture . . . . 15s. and	1	1	0
Cardboard model of a ray of ordinary light, showing two planes of vibration	0	3	6
Model to show the action of two Tourmaline plates in polarizing light	1	1	0
Ditto, to illustrate the principles of construction of the Oxy-hydrogen Polariscope	2	12	6
POWELL's *Apparatus*, for the popular illustration of plain, circular, and elliptical Vibrations . . .	3	13	6
Glass Model of Rhomb of Iceland Spar, to illustrate the separation of a ray of light by double refraction	0	18	0

PHOTOGRAPHY.

Perhaps no branch of Natural Philosophy ever occupied so large a share of the public attention as Photography. The simplicity and certainty of the processes, and the exquisite beauty of the results, alone form a strong inducement for those who have leisure to cultivate this delightful and fascinating art. But when we add to this the many useful purposes to which it is applicable, and the great assistance that it is capable of rendering to Science and the Fine Arts, it becomes no matter of surprise that every one who can give the smallest amount of time to its pursuit should follow it up with spirit.

LENSES.

Single Achromatic Lenses, unmounted, suitable for taking views by Calotype or Daguerreotype processes :—

	Diameter.	Focus.	£	s.	d.
No. 1.	1¼ inches	4 to 6 inches	0	6	0
2.	1½ "	6 to 7 "	0	8	0
3.	1¾ "	6 to 8 "	0	10	0
4.	2 "	8 to 10 "	0	14	0
5.	2¼ "	8 to 10 "	0	18	0
6.	2⅝ "	10 to 12 "	1	6	0
7.	3 "	12 to 14 "	1	16	0
8.	3½ "	12 to 14 "	2	10	0
9.	4 "	16 to 18 "	3	10	0

The same Lenses, mounted in handsome brass fronts, with rings for adaptation to Camera :—

	Diameter.	Simple sliding tube.			Rack & pinion.		
		£	s.	d.	£	s.	d.
No 1	1¼ inches	0	16	0	1	1	0
2.	1½ "	1	1	0	1	7	0
3	1¾ "	1	5	0	1	12	0
4.	2 "	1	12	6	2	2	0
5.	2¼ "	1	15	0	2	7	6
6.	2⅝ "	2	5	0	2	15	0
7	3 "	3	15	0	4	10	0
8.	3½ "	4	14	6	6	0	0
9	4 "	6	10	0	7	7	0

COMPOUND ACHROMATIC LENSES.

These combinations are particularly recommended from the qualities they possess of giving a flat field, and producing an image on the sensitive surface, in an extremely short space of time.

Combination Achromatic Lenses, mounted in handsome brass fronts, with rackwork adjustment, and adapted for either portraits or views:—

			£	s.	d.		£	s.	d.
No. 1	for pictures	4¼ by 3¼ inches .	2	10	0	and	3	13	6
No. 2.	"	5 by 4 " .	0	0	0		4	14	6
No. 3.	"	arranged for views and portraits					5	5	0
No. 4.	"	6½ by 4¾ inches .	5	10	0	and	7	7	0
No. 5.	"	arranged for views or portraits .	6	10	0		8	8	0
No. 6.	"	8½ by 6½ inches .	0	0	0		15	15	0
No. 7.	"	arranged for views and portraits					16	16	0

The arrangement of the above Lenses for views, consists in the removal of one lens in the combination, and placing the other in a different position in the sliding tube, with the requisite stops or diaphragms for regulating the amount of light.

BLAND & LONG'S LANDSCAPE LENSES.

Messrs. B. & L. feel great confidence in recommending these Lenses to amateurs and professional photographers, as they give a perfectly flat field, and from their quick action are particularly adapted for taking views where great delicacy is a desideratum.

				£	s.	d.
No. 1.	1¾	inches diameter,	rackwork adjustment	2	12	6
No. 2.	2¼	"	"	3	10	0
No. 3.	3	"	"	5	10	0

MENISCUS LENSES.

	Diameter.	Focus.	£	s.	d.
No. 1	1¾ inches	8 to 10 inches	0	4	0
2	2 "	9 to 10 "	0	5	0
3	2¾ "	10 to 12 "	0	7	6
4	3 "	12 to 14 "	0	9	0
5	3½ "	14 to 16 "	0	10	6

MIRRORS.

Parallel Mirrors for placing in front of the lenses, to take pictures in their true position.

	£	s.	d.
For ¼ plate lens	1	10	0
½ "	2	12	6
Prisms adapted for same purpose, from	3	3	0

PHOTOGRAPHIC CAMERAS,

Adapted for views on paper and glass.

		£	s.	d.
No. 1.	Simple form of Camera, consisting of Mahogany box, with a Meniscus lens, mounted in brass front, for pictures 6 in. by 5 in., with Calotype back, and ground glass	1	7	6
No, 2.	Ditto, ditto, for pictures 8½ in. by 6½ in. . . .	2	7	6
No. 3.	Mahogany Camera, with Achromatic lens, 1¾ in. diameter, mounted in brass front, with two backs, one for paper and the other for Collodion pictures; size of paper 6 in. by 5 in., ditto glass plates 4 in. by 3 in., and 3¼ in, by 2¾ in. . . .	3	3	0
No. 4.	Ditto, ditto, with double back, suitable for paper only, size 7 in. by 6 in.	3	3	0
No. 5.	Ditto, ditto, with Achromatic lens, 2¼ in. diameter, mounted in brass front, of superior construction, with two backs for paper 7 in. by 6 in., and Collodion pictures 5 in. by 4 in., 4 in. by 3 in., and 3¼ in. by 2¾ in.	4	4	0
No. 6.	Ditto, with Achromatic lens 2⅜ in. diameter, in brass front, double back for paper 9 in. by 7 in.	5	10	0

RIGID CAMERAS,

For the Paper processes only.

		£	s.	d.
No. 1.	Mahogany Camera, with single Achromatic lens, mounted in sliding brass front, with one double back for views, 6 in. by 5 in. . . .	2	12	6
No. 2.	Ditto, ditto, of superior construction . .	4	0	0
No. 3.	Ditto, ditto, with double combination Achromatic lens, for views 6 in. by 5 in., or portraits 4¼ in. by 3¼ in.	6	10	0
No. 4.	Ditto, ditto, with single Achromatic lens, 2¼ in. diameter, mounted in sliding brass front, with double back for views 7 in. by 6 in. .	4	10	0
No. 5.	Ditto, ditto, of superior construction .	5	10	0
No. 6.	Ditto, ditto, with double combination Achromatic lens, sliding front for adjusting proportion of foreground and sky, for views 7 in. by 6 in., or portraits up to 5 in. by 4 in. . .	9	9	0
No. 7.	Ditto, ditto, with single Achromatic lens, mounted in sliding front, double back for views 9 in. by 7 in.	6	0	0
No. 8.	Ditto, ditto, of superior construction, with sliding plate for adjustment of foreground and sky	7	7	0
No. 9.	Ditto, ditto, with compound Achromatic lens, sliding adjustment, adapted for views 9 in. by 7 in., or for portraits up to 6 in. by 5 in. .	12	0	0
No. 10.	Ditto, ditto, of best construction, with compound Achromatic lens, and sliding front for adjusting foreground and sky, for views 10 in. by 8 in., or portraits up to 8½ in. by 6½ in.	19	0	0

SLIDING BODY CAMERAS,

Adapted for Calotype, Daguerreotype, and Collodion processes.

No.		£	s.	d.
No. 1.	Walnut Camera, sliding body, with single Achromatic lens, and slides adapted for paper, plates, and glass, size 4¼ in. by 3¼ in.	1	15	0
No. 2.	Ditto, ditto, with single Achromatic lens, adapted for paper, plates, and glass 6½ in. by 4¾ in.	2	17	6
No. 3,	Ditto, ditto, single Achromatic lens, adapted for plates, paper, and glass 8½ in. by 6½ in.	4	10	0
No. 4.	Mahogany sliding body Camera, best construction, with ground glass frame and two backs, for paper, glass, or Daguerreotype processes, with Achromatic combination lens, suitable for portraits 4¼ in. by 3¼ in., and views 6 in. by 5 in.	6	16	6
No. 5.	Ditto, ditto, with Achromatic combination lens, for portraits of sizes to 6½ in. by 4¾ in., and views 7 in. by 6 in., adapted for paper, Daguerreotype, and glass processes	11	10	0
No. 6.	Ditto, ditto, with compound Achromatic lens, with fine rackwork adjustment, ground glass frame and two backs, for portraits on paper, plates, and glass up to 6 in. by 5 in., and single Achromatic lens with sliding tube adjustment, for paper views 9 in. by 7 in.	15	0	0
No. 7.	Ditto, ditto, with compound Achromatic lens as before, with ground glass frame and two backs, suited for Calotype, Daguerreotype, and Collodion portraits up to 8½ in. by 6½ in., and views, &c. 10 in. by 8 in.	21	0	0

FOLDING PHOTOGRAPHIC CAMERAS.

This form of Camera will be found of great convenience where portability is a desideratum, and consequently most efficient for the purposes of the traveller and tourist.

These Instruments are of the best workmanship, and are so constructed as not to warp nor lose their shape when exposed to the sun and weather.

		£	s.	d.
No. 1.	Mahogany folding Camera, with single Achromatic Lens, mounted in brass front, with double back, for views, 6 in. by 5 in.	4	4	0
No. 2.	Ditto, ditto, of superior construction	5	10	0
No. 3.	Ditto, ditto, with double-combination lens, and adjustment for regulating amount of foreground and sky, suitable for views 6 in by 5 in. or portraits 4¼ in. by 3¼ in.	8	18	6
No. 4.	Ditto, ditto, with single Achromatic lens, 2¼ in. diameter, mounted in brass front, with double back for paper views, 7 in. by 6 in.	5	5	0
No. 5.	Ditto, ditto, of superior construction	7	7	0
No. 6.	Ditto ditto, with double-combination Achromatic lens, and sliding front for adjusting foreground and sky, for views 7 in. by 6, or portraits up to 5 in. by 4 in.	11	5	0
No. 7.	Ditto, ditto, with single Achromatic lens, mounted in brass front, double back for paper, 9 in. by 7 in.	7	7	0
No. 8.	Ditto, ditto, best make and quality	9	9	0
No. 9.	Ditto, ditto, of best construction, with double-combination Achromatic lens, mounted in brass front, with rackwork adjustment, sliding front, adapted to portraits up to 6 in. by 5 in., or views 9 in. by 7 in.	14	14	0
No. 10.	Ditto, ditto, of best construction, with double-combination Achromatic lens, mounted in brass front, with rackwork adjustment, sliding front, suitable for views 10 in. by 8 in., and portraits 8¼ in. by 6¼ in.	21	0	0

Leather sling Cases for holding the above Cameras, very convenient for travelling, from £1 to £3.

Traversing Cameras, by which a panoramic view may be taken with a small lens, from £10 10s.

TRIPOD STANDS FOR CAMERAS.

To ensure success in taking either portraits or views, it is very essential that the Camera should be perfectly free from vibration; if this be not the case, it is obviously impossible to obtain a perfectly sharp impression. Lightness, with freedom from vibration, are combined in the Camera Stands offered in the following list:—

	£	s.	d.
No. 1. Tripod, with metal top, double legs of mahogany, suitable for small Camera . . .	0	12	0
No. 2. Ditto, ditto, larger size, and of superior construction . .	0	18	0
No. 3. Tripod, with double legs of ash, metal top, extremely firm and free from vibration, forming when apart a very portable stand . . .	1	10	0
No. 4. Ditto, ditto, with legs jointed for convenience of carriage .	1	17	6
No. 5. Tripod, with double legs, and large ball and socket joint for adjustment of Camera .	1	10	0
No. 6. Tripod, with sliding adjustment for raising or depressing Camera, convenient for an operating room	1	18	0
No. 7. Tripod, with double legs of ash, mahogany top .	1	5	0
No. 8. Tripod, with double legs, and board and screw at top, for inclining camera	1	10	0
No. 9. Tripod, with double legs of ash, with screw joints, very portable	2	2	0

HEAD RESTS,

For enabling the Sitter to keep the Head in one position without fatigue.

		£	s.	d.
No. 1.	Head Rest of simplest form, for attaching to back of chair . . . . 5s. &	0	7	6
No. 2.	American pattern ditto	1	1	0
No. 3.	Universal ditto, with means of adjustment for every position of the head	1	10	0
No. 4.	Ditto, ditto, with heavy iron foot and brass sliding tube, which enables this rest to be used either for standing or sitting posture . . .	3	3	0

APPARATUS USED IN THE DAGUERREOTYPE.

Under this head are enumerated all the apparatus, materials, and preparations required by the Photographer in operating on Silvered Plates.

DAGUERREOTYPE PLATES, ENGLISH MANUFACTURE.

Size.	Best.	2nd quality.	Size.	Best.	2nd quality
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
2½ by 2	0 12 0	0 12 0	5 by 4	2 5 0	2 3 0
3¼ by 2¾	1 0 0	0 18 0	6 by 4½	3 5 0	3 0 0
4 by 3	1 8 0	1 7 0	8½ by 6½	5 12 0	5 0 0
4¼ by 3¼	1 12 0	1 10 0	—	—	—

PLATES, BEST FRENCH MANUFACTURE.

Size.	40ths.	30ths.	Electro-Plated.
	£ s. d.	£ s. d.	£ s. d.
2½ by 2	0 4 0	0 5 0	0 5 6
3¼ by 2¾	0 6 0	0 7 6	0 8 6
4 by 3	0 9 0	0 10 6	0 12 0
4¼ by 3¼	0 10 0	0 11 6	0 13 0
5 by 4	0 14 6	0 15 6	0 19 0
6½ by 4¾	1 1 0	1 3 6	1 5 0
8½ by 6½	1 18 0	2 2 0	2 7 6

APPARATUS USED IN DAGUERREOTYPE.

PLATE BOXES.

Each containing grooves for 12 plates.

Size.	Mahogany.			Walnut Wood.		
	£	s.	d.	£	s.	d.
2½ by 2 inches.	0	3	0	0	1	8
3¼ by 2¾ "	0	4	0	0	2	0
4 by 3 "	0	4	6	0	2	3
4¼ by 3¼ "	0	5	0	0	2	6
5 by 4 "	0	5	6	0	3	0
6½ by 4¾ "	0	6	0	0	3	6
8½ by 6½ "	0	7	6	0	4	6

PLATE HOLDERS.

Plate holders of wood, with brass corners and cramp to fix to table while cleaning or polishing.

	£	s.	d.
No. 1. For plates, 2½ by 2 inches	0	2	0
No. 2. " 3¼ by 2¾ "	0	2	6
No. 3. " 4 by 3 "	0	2	9
No. 4. " 4¼ by 3¼ "	0	3	0
No. 5. " 5 by 4 "	0	3	3
No. 6. " 6½ by 4¾ "	0	3	6
No. 7. " 8½ by 6½ "	0	4	0

Simple polishing block, for holding the plate while buffing, 1s. 6d. and 2s. 6d.

Metal plate holders, for use with circular buffs in the lathe, or for securing the plate while buffing by hand, of superior make.

	£	s.	d.
For plates, 2½ by 2 inches	0	6	0
" 3¼ by 2¾ "	0	7	6
" 4 by 3 "	0	8	6
" 5 by 4 "	0	10	0
Handle of hard wood, with steel pin for use with ditto	0	1	0

AMERICAN PLATE HOLDER,

Consisting of a strong iron clamp, which firmly secures one edge of the plate, and allows of vigorous use of the buff.

	£	s.	d.
Iron clamp on wood block	0	7	6
Flat iron blocks for plates:—			
No. 1. 2½ by 2 inches	0	2	0
No. 2. 3¼ by 2¾ "	0	2	6
No. 3. 4 by 3 " or 4¼ by 3¼ inches .	0	3	0
No. 4. 6½ by 4¾ "	0	5	0
Apparatus for bending the edges of thin French plates, to prevent injury to the buff . . .	0	8	0
Pliers of an improved form, for bending the corners of plates, and also for holding the plate in drying	0	2	0

BUFFS.

The materials used in covering these buffs are rendered free from grease and any other impurities naturally existing in them.

	Size.	Velvet.			Doeskin.		
		£	s.	d.	£	s.	d.
No. 1.	12 by 3 inches.	0	3	0	0	5	0
No. 2.	15 by 3 "	0	4	0	0	6	0
No. 3.	16 by 4 "	0	4	6	0	7	6
No. 4.	9 by 6 "	0	5	0	0	8	0

	£	s.	d.
Best carded cotton wool . . . . . per lb.	0	3	0
Hard wood sifting boxes, for containing polishing powders . . . . each	0	1	6

Materials for polishing plates *(see page 26)*.

IODINE AND BROMINE PANS.

		£	s.	d.
Porcelain dishes for Iodine or Bromine, with ground glass covers, from		0	2	0
Glass dishes with air-tight covers:—				
4½ by 3½ by 2 inches	each	0	8	6
7 by 5 by 3 "	"	0	13	0
8¾ by 6¾ by 3 "	"	0	19	0

IODINE AND BROMINE BOXES.

Single Iodine or Bromine box, of French polished mahogany, with glass pan, ground glass air-tight cover, and mirror for viewing the plate while under the influence of the vapour:—

	£	s.	d.
For plates 4¼ by 3¼ inches downwards	1	5	0
" 6½ by 4¾ " "	2	2	0
" 8½ by 6½ " "	3	10	0

COMPOUND IODINE AND BROMINE BOXES.

This form of Bromine box is extremely convenient, as it enables the operator to readily change the plate from the Iodine to the Bromine without exposure, and at the same time to see the colour produced by the vapour.

Compound Iodine and Bromine box, of French polished mahogany, with glass pans, polished sides, mirrors, and set of frames, &c., complete:—

	£	s.	d.
For plates 4¼ by 3¼ inches, and under	2	7	6
" 6½ by 4¾ " "	3	13	6
" 8½ by 6½ " "	6	6	0

Single Iodine or Bromine boxes, French pattern, without mirrors:—

	Delf pans.			China pans.		
	£	s.	d.			
For ¼ plate size, with set of frames	0	13	0	0	16	0
½ plate " "	0	16	0	1	0	0
whole plate size "	1	0	0	1	12	0

Double Iodine and Bromine boxes, French pattern, without mirrors:—

For ¼ plate size, with set of frames	1	6	0	1	16	0
½ plate " "	1	12	0	2	6	0
whole plate size "	2	2	0	2	18	0

MERCURY BOXES.

	£	s.	d.
Mercury box, of mahogany, with shifting legs, cast-iron cistern, and frames, complete:—			
No. 1. for plates 4¼ by 3¼ inches	0	15	0
No. 2. " 6½ by 4¾ "	1	5	0
No. 3. " 8½ by 6½ "	1	15	0
Ditto, ditto, French pattern, walnut wood:—			
No. 1. for plates 4¼ by 3¼ inches	0	12	0
No. 2. " 6½ by 4¾ "	0	16	0
No. 3. " 8½ by 6½ "	1	2	6
Thermometers with ivory scales to mercury boxes, each	0	7	6
Mercury boxes of improved construction, with window and yellow glass, for viewing the picture during the action of the mercury:—			
No. 1. for plates 4¼ by 3¼ inches	1	4	0
No. 2. " 6½ by 4¾ "	1	10	0
No. 3. " 8½ by 6½ "	2	2	0

MISCELLANEOUS APPARATUS.

	£	s.	d.
Fixing Stands with levelling screws:—			
No. 1. for ¼ plate size	0	3	6
No. 2. ½ "	0	5	6
No. 3. whole plate size	0	7	6
Glass Spirit Lamps, each 1s., 1s. 6d., 2s., 2s. 6d., to	0	5	0
Gas Jets, with metal chimney and gauze, with flexible tube for burning off plates without smoke, each	0	10	6
Lanterns, furnished with yellow glass shades, for use in dark room . . . 5s. and	0	8	0
Brass Spirit Lamps . . . from	0	2	6
Porcelain Washing Pans:—			
No. 1. size 5½ by 4½ by 1⅛	0	1	0
No. 2. " 7½ by 6 by 1⅛	0	1	6
No. 3. " 10 by 8 by 1⅝	0	3	0

GLASS GRADUATED MEASURES.

	£	s.	d.		£	s.	d.
1 oz.	0	1	3	6 oz.	0	2	4
2 oz.	0	1	4	8 oz.	0	2	9
4 oz.	0	2	0	Minim ditto	0	1	0

		£	s.	d.
Glass Funnels	each, 4d., 6d., and	0	1	0
Ditto Syringes	from each	0	0	4
Ditto, ditto, graduated	"	0	1	0

STILLS.

It is found very convenient frequently, to have at hand the means of obtaining pure water at a trifling cost; this desideratum is acquired in a very economical way by the use of a small still, which can be placed over a common fire.

	£	s.	d.
Tin Still to hold half a gallon, with worm tub complete, for use over the common fire	0	17	6
Ditto, ditto, one gallon	1	1	0
Ditto, ditto, two ditto	1	7	6
Copper ditto, half ditto	1	10	0
Ditto, ditto, one ditto	2	2	0

ELECTRO-SILVERING APPARATUS,

For giving a coating of pure silver to Daguerreotype plates, and also for re-silvering used up plates.

Smee's Batteries No. 1, 8s 6d. No. 2, 11s. 6d.

		s.	d.
Glass Cells, fitted with binding screws complete:—			
For plates 4¼ by 3¼ inches		5	6
Ditto 6½ by 4¾ "		7	6
Ditto 8½ by 6½ "		15	0
Porcelain Cells, fitted as above:—			
For plates 4¼ by 3¼ inches		4	0
Ditto 6½ by 4¾ "		6	0
Pure silver foil for the above	per oz.	8	6
Argento-Cyanide of Potassium	per pint	10	0
Ditto, ditto, full strength	" oz.	1	0

APPARATUS, &c., USED IN THE CALOTYPE AND OTHER PAPER PROCESSES.

Porcelain pans with flat bottoms, for preparing & washing paper:—

	s.	d.
No. 1. size 5½ by 4½ by 1⅛ inches . .	1	0
No. 2. " 7½ by 6 by 1⅛ " . .	1	6
No. 3. " 10 by 8 by 1⅝ " . .	3	0
No. 4. " 8¾ by 6¾ by 1⅛ " . .	1	3
No. 5 " 10 by 7½ by 1⅛ " . .	1	6
No. 6. " 11 by 9 by 1⅛ " . .	2	0
No. 7 " 13 by 11 by 1¼ " . .	4	0
No. 8. " 15 by 11 by 1½ " . .	5	0
No. 9. " 9½ by 8½ by 2½ " . .	2	6
No. 10. " 10½ by 8½ by 2¼ " . .	2	9
No. 11. " 11 by 10 by 2½ " . .	3	0

GUTTA PERCHA WASHING TRAYS.

No. 1. Nest of three gutta percha trays:—

Size of largest 10 by 8 by 1¾ inches . .	9	0

No. 2. Nest of three ditto:—

Largest 11 by 9 by 1¾ inches . . .	12	0

Gutta percha pans, of very superior finish, with perfectly flat and polished bottoms:—

No. 1. size 12½ by 10½ inches . . .	8	0
No. 2. " 12 by 10 " . . .	6	6
No. 3. " 11½ by 9½ " . . .	5	6
No. 4. " 11 by 9 " . . .	4	0
Or nest of four of above sizes . . .	21	0

Boards for the preparation of paper:—

No. 1. for paper 6 by 5 inches . . .	1	6
No. 2. " 7 by 6 " . . .	1	9
No. 3. " 9 by 7 " . . .	2	6

Glass rods for spreading the solutions . . each, 4d. and 6d.

Ditto, Graduated Measures:—

	s.	d.		s.	d.
1 oz. . .	1	3	8 oz. . . .	2	9
2 oz. . .	1	4	Minim Measures, 120 drops	1	0
4 oz. . .	2	0	Do., do., ½ oz.	1	0
6 oz. . .	2	4			

GLASS FUNNELS,

Ribbed inside, for filtering.

		s.	d.
No. 1.	2 inches diameter	0	4
No. 2.	2½ "	0	5
No. 3.	4 "	0	6
No. 4.	5 "	0	8
No. 5.	6 "	1	0
No. 6.	7 "	1	4

Funnels, Wedgwood, cream colour, ribbed inside:—

No. 1.	2 inches diameter	0	5
No. 2.	3½ "	0	8
No. 3.	4 "	0	10
No. 4.	5 "	1	4
No. 5.	6 "	2	0
No. 6.	6½ "	2	6

FILTER HOLDERS, very useful for filtering small quantities of liquid . . . each, 3d., 6d., and 8d.

GLASS SYRINGES, for taking up definite quantities of solutions. Plain, from 4d.; Graduated, from 1s.

Stands for holding Funnels, with 3 sliding rings, each, 3s. and 4s.

SCALES AND WEIGHTS.

		£	s.	d.
No. 1.	In oak box, metal pans	0	3	6
No. 2.	Ditto "	0	5	0
No. 3.	Ditto glass pans	0	7	0
No. 4.	Mahogany box "	0	12	0
No. 5.	Ditto, with brass pillar and glass shifting pan, with drawer	2	2	0

CAMEL'S HAIR BRUSHES,

Made expressly for Calotype.

	s.	d.		s.	d.
1½ inches broad, each	1	6	3 inches broad, each	2	6
2 " "	1	9	4 " "	3	6
2½ " "	2	3	5 " "	4	6

Thick round ditto . . . each, 1s., 1s. 6d., and 2 0

BLAND & LONG'S ALBUMENIZED PAPER.

For Printing from Glass or Paper Negatives.

The great superiority of the definition obtained by this method of printing over that of the ordinary process, renders it necessary that all pictures—where great minuteness of detail is essential to their successful effect—should be printed on Albumenized paper. It is easily prepared, and will give every colour, from a Sepia to a perfect black.

		£	s.	d.
Size, 17½ by 11 inches	per quire	0	10	0
Do., 11 by 9 "	"	0	5	0

DRAWING PINS, for hanging up wet paper, 5d. per dozen.

PHOTOGRAPHIC PAPER.

As much of the success of the Talbotype and other paper processes depends on the nature of the material on which the sensitive compound is placed, a careful selection of papers from the best makers has been made, combining fineness of surface and evenness of texture, with a proper tenacity to allow of the necessary washings to which the paper is exposed in the various manipulations.

		Per quire		
		£	s.	d.
Canson Frères—				
Size, 22½ in. by 17½ in.	Negative . . .	0	8	6
	Positive . .	0	4	6
Whatman's—				
Size, 19 in. by 15 in.	Negative . . .	0	3	0
	Positive . . .	0	2	6
Turner's Photographic paper—				
Size, 15 in. by 9 in.	Negative . . .	0	3	0
	Positive . . .	0	1	6
Sandford's best, negative and positive; size, 15 by 9 in.		0	2	6
Ditto, waxed paper " " 17 by 11 in.		0	19	0
Ditto " iodized " "		1	4	0
Ditto, iodized paper . . . " 19 by 15 in.		1	4	0
Bland and Long's iodized paper, 9½ by 7½ in., per doz.		0	4	0

		£	s.	d.
Solution for iodizing paper	per oz.	0	1	6
Ditto ditto for waxed paper	per pint	0	5	0
Ditto, for rendering the above sensitive	"	0	9	0
White bibulous paper, prepared free from iron or other impurities	per quire	0	1	6
Papier Joseph	"	0	1	0

REVERSING FRAMES,

For obtaining Positive pictures.

These Frames are so constructed that a uniform pressure may be obtained, thus ensuring perfect contact between the negative and positive papers.

	Size of glass.	£	s.	d.
No. 1.	6½ by 5 inches	0	5	0
No. 2.	8 by 6 "	0	7	6
No. 3.	10½ by 8½ "	0	12	0
No. 4. with screws at side,	14 by 9 "	1	5	0
No. 5. "	17 by 11 "	1	10	0

FRENCH PATTERN REVERSING FRAMES, with hinged back, by which the progress of the picture may be observed :—

		£	s.	d.
No. 1.	7 by 6 inches	0	10	0
No. 2.	10 by 8 "	0	14	0
No. 3.	12 by 9 "	1	1	0

APPARATUS USED FOR THE COLLODION AND ALBUMEN PROCESSES.

In the following list will be found all the necessary materials and apparatus for use in both the Collodion and Albumenized Glass processes, together with forms of Focimeter for determining the chemical foci of lenses.

GLASS PLATES, WITH GROUND EDGES.

Size.	Per doz. s.	d.	Size.	Per doz. s.	d.
3¼ by 2¾ inches	1	4	5 by 4 inches	2	3
4 by 3 "	1	6	6 by 5 "	3	6
4¼ by 3¼ "	1	9	8½ by 6½ "	6	6

BOXES FOR HOLDING GLASS PLATES.

			s.	d.		s.	d.
No. 1.	3¼ by 2¾	inches, for containing 12 plates	2	0	and	2	9
No. 2.	4 by 3	" " .	2	3	"	3	0
No. 3.	4¼ by 3¼	" " .	2	6	"	3	6
No. 4.	5 by 4	" " .	3	0	"	4	0
No. 5.	6 by 5	" " .	3	6	"	4	8
No. 6.	8½ by 6½	" " .	4	6	"	6	6

GUTTA PERCHA BATHS,

With Mahogany Stands, for Nitrate of Silver.

No. 1.	For plates	4 by 3 inches	each	3	0
No. 2.	"	5 by 4 " . . .	"	4	0
No. 3.	"	6 by 5 " . . .	"	5	0
No. 4.	"	7 by 6 " . . .	"	6	6
No. 5.	"	8½ by 6½ " . . .	"	8	6
Glass Baths for ditto		. . . . .	from	5	6

Glass Dippers, for plunging the plates into the bath of Nitrate of Silver:—

No. 1, 8d. No. 2, 10d. No. 3, 1s.

Porcelain Pans for washing, &c. *(See page* 19).

LEVELLING STANDS,

With screws, for laying glass plates with Albumen, or developing Collodion pictures.

	s.	d.
No. 1. For small plates	3	6
No. 2.	5	6
No. 3.	7	6

SCALES AND WEIGHTS.

No. 1.	In oak box, metal pans . . .	3	6
No. 2.	ditto ditto . . .	5	0
No. 3.	ditto glass pans . . .	7	0
No. 4.	In mahogany box, ditto . . .	12	0
No. 5.	Ditto, with brass pillar, and glass shifting pan with drawer .	42	0

BLAND AND LONG'S VARNISH,

For protecting the Collodion picture from injury during printing . . . . per ounce, 4d

This varnish is a most perfect protection and is easily applied; it possesses the qualities of extreme hardness, transparency, and rapidity of drying in the highest degree.

FILTER RINGS, useful in filtering small quantities of liquids . . . . each, 3d., 6d., and 8d.

GLASS GRADUATED MEASURES *(See page 17).*

	£	s.	d.
CLAUDET'S FOCIMETER, for ascertaining the amount of separation existing between the optical and chemical foci of lenses . .	2	2	0
Bland and Long's form of Focimeter	1	10	0

DAGUERREOTYPE COLOURS.

No. 1. Box, containing 10 best colors, gold and silver shells, and an assortment of brushes . .	0	14	0
No. 2. Ditto, ditto, 12 best colors, gold and silver shells, brushes, &c.	1	10	0
No. 3. Box, containing 15 colors of finest quality, in small bottles with directions, an assortment of brushes, gold and silver shells, and elastic bottle	2	2	0
No. 4. Redman's improved colors, in box . .	1	1	0
No. 5 Mansion's ditto, ditto. . £1 11s. 6d. &	2	10	0
Separate colors . . per bottle, 2s., 2s. 6d. &	0	3	0
Camel's hair brushes . . . per dozen, 1s. &	0	2	0
Sable ditto, ditto . . . . . . 4s. &	0	5	0

Elastic bottle, for removing dust from the plate:—

No. 1, 3s. No. 2, 4s. No. 3, 5s.

MOROCCO CASES,

With Gilt Mats.

Morocco cases, fitted with gilt mats and glasses, for finished pictures.

					Best.			2d quality		
					£	s.	d.	£	s.	d.
No 1.	For plates,	2½ by 2	inches,	per doz.	0	12	0	0	10	0
No. 2.	"	3¼ by 2¾	"	"	1	0	0	0	17	0
No. 3.	"	4 by 3	"	"	1	8	0	1	4	0
No. 4.	"	4¼ by 3¼	"	"	1	10	0	1	6	0
No. 5.	"	5 by 4	"	"	2	2	0	2	0	0
No. 6.	"	6½ by 4¾	"	"	4	4	0			

MOROCCO FRAMES,

With Suspension Rings, Mats, and Glasses.

					£	s.	d.
No. 1.	For plates,	2½ by 2	inches	per dozen	0	8	0
No. 2.	"	3¼ by 2¾	"	"	0	14	0
No. 3.	"	4 by 3	"	"	0	16	0
No. 4.	"	4¼ by 3¼	"	"	0	18	0

GILT MATS,

Of superior quality, of Oval, Dome, or Cushion Shapes.

					£	s.	d.
No. 1.	For plates,	2½ by 2	inches	per dozen	0	2	0
No. 2.	"	3¼ by 2¾	"	"	0	2	9
No. 3.	"	4 by 3	"	"	0	4	6
No. 4.	"	4¼ by 3¼	"	"	0	5	6
No. 5.	"	5 by 4	"	"	0	7	0

BLACK PAPIER MACHÉ FRAMES,

With Gilt Rim and Suspension Ring.

				£	s.	d.
No. 1.	2½ by 2	inches	each	0	4	0
No. 2.	3¼ by 2¾	"	"	0	5	6
No. 3.	4 by 3	"	"	0	6	6
No. 4.	4¼ by 3¼	"	"	0	7	6

ORMOLU FRAMES,

With Gilt Mats and Glasses.

		£	s.	d.
No. 1.	For plates, 2½ by 2 inches	0	1	9
No. 2.	" 3¼ by 2¾ "	0	2	9
No. 3.	" 4¼ by 3¼ "	0	4	0
No. 4.	" 5 by 4 "	0	7	6
No. 5.	" 6½ by 4¾ "	0	10	6

PASSE PARTOUTS,

For Daguerreotype, Glass, or Paper Portraits and Views.

		Dark ground			White & gold		
		£	s.	d.	£	s.	d.
No. 1.	For plates, 2½ by 2 inches, per doz.	0	5	0	0	6	0
No. 2.	" 3¼ by 2¾ " "	0	6	0	0	7	0
No. 3.	" 4 by 3 " "	0	7	0	0	8	0
No. 4.	" 4¼ by 3¼ " "	0	7	6	0	8	6
No. 5.	" 5 by 4 " "	0	10	6	0	12	0
No. 6.	" 6½ by 4¾ " "	0	14	0	0	16	0
No. 7.	" 8½ by 6½ " "	1	7	0	1	10	0

GUTTA PERCHA FRAMES.

	£	s.	d.
For No. 1 Passe Partouts	0	1	0
" No. 2 "	0	1	6
" No. 3 "	0	2	0

Larger sizes to order.

PURE CHEMICALS AND PREPARATIONS

Used in the Photographic Processes:

Messrs. Bland and Long feel great confidence in submitting the following list of Chemicals, &c., to the notice of Photographers, as being of the first quality and of perfect purity.

DAGUERREOTYPE.

		£	s.	d.
Bromine, in 1 oz. bottles		0	3	6
" Solution	per oz.	0	0	4
" Chloride, prepared for use	"	0	0	6
Bromide of lime	per bottle	0	2	9
" iodine	per oz.	0	1	0
Chloro-bromide of lime	per bottle	0	3	6
Charcoal, prepared, for polishing plates	per packet	0	1	0
Cotton wool, best	per oz. 3d., per lb.	0	3	0
Gold, Chloride, in bottles	¼ dram	0	3	6
" "	½ "	0	6	0
" "	1 "	0	11	0
" "	2 "	1	1	0
Gold, Salt of (Sel d'or)	per bottle	0	4	6
Iodine, pure, re-sublimed (variable)	per oz.	0	2	0
" Commercial	"	0	1	6
" Tincture	"	0	0	6
" Chloride	"	0	3	0
Lime, Bromide	per bottle	0	2	9
" Iodide	"	0	2	6
Lamp Black, prepared, for buffing	per packet	0	1	0
Mercury, pure distilled	per oz. 4d., per lb.	0	4	0
Naphtha, for lamp	per pint	0	1	6
Rottenstone, prepared, for polishing	per ounce	0	0	6
Rouge " "	"	0	0	6
Sensitive solution	per bottle	0	2	6
Silver solution (Argento-cyanide of potassium), for re-silvering Daguerreotype plates	per ounce	0	1	0
Soda, Hyposulphite, pure	per lb. 1s. 6d., per oz.	0	0	2
Tripoli, prepared, for polishing	"	0	0	6
Water, distilled	per gallon	0	0	8

CALOTYPE AND PAPER PROCESSES.

		£	s.	d.
Acid, Acetic glacial, pure	per oz.	0	1	0
“ Gallic	“	0	2	0
“ Succinic	“	0	5	0
Ammonia, pure	“	0	0	2
Muriate, free from iron	“	0	0	6
Ammonium, Iodide (variable)	“	0	4	0
Barium, Chloride	“	0	0	6
“ Iodide (variable)	“	0	4	0
Gold, Chloride	per dram	0	11	0
“ Solution, for darkening positives	per oz.	0	0	6
Iron, Protosulphate, pure	“	0	0	2
“ Per-nitrate, solution	“	0	0	3
“ Ammonio-citrate	“	0	0	9
“ Iodide (variable)	“	0	2	0
Potassa, Chlorate	“	0	0	3
“ Nitrate	“	0	0	3
Potassium, Bromide, pure (variable)	“	0	3	0
“ Cyanide	“	0	0	6
“ Iodide (variable)	“	0	2	6
“ Ferrocyanate (yellow prussiate)	“	0	0	4
“ Ferridcyanide (red prussiate)	“	0	0	6
“ Fluoride	“	0	2	0
Silver, Nitrate, crystallized	“	0	5	0
“ “ fused	“	0	5	0
“ Ammonio-nitrate	“	0	1	0
“ Iodide	“	0	10	0
“ “ in Iodide of Potassium	“	0	1	6
Soda, Hyposulphite	per lb., 1s. 6d., “	0	0	2
Sodium, Chloride, pure	“	0	0	3
“ Fluoride	“	0	1	6
Sugar of Milk	“	0	0	4
Solution for iodizing waxed paper	per pint	0	5	0
“ rendering “ sensitive	“	0	9	0
White Wax	per lb.	0	3	6

COLLODION AND ALBUMEN GLASS PROCESSES.

		£	s.	d.
Acid, Acetic glacial	per oz.	0	0	8
“ Arsenious	“	0	0	4
“ Pyrogallic, pure	per dram	0	2	6
“ Sulphuric, pure	per oz.	0	0	2
“ “ common	per lb.	0	0	3
Ammonia, pure	per oz.	0	0	2
Ammonium, Iodide (variable)	“	0	4	0
Barium, Iodide, “	“	0	4	0
Baryta, Nitrate, pure	“	0	0	3
Collodion	“	0	0	8
“ Iodized	“	0	0	9
Æther, Sulphuric, rectified	“	0	0	6
Iron, Protosulphate, pure	“	0	0	2
“ Protonitrate, solution	“	0	0	3
“ Iodide (variable)	“	0	2	0
Potassa, Nitrate, powdered	per lb.	0	1	0
Potassium, Iodide (variable)	per oz.	0	2	6
Silver, Nitrate, crystallized	“	0	5	0
“ Iodide	“	0	10	0
Soda, Hyposulphite . . per lb. 1s. 6d.,	“	0	0	2
Varnish for protecting glass pictures	“	0	0	4
Solution for rendering negatives positive	“	0	0	4
Iodizing solution for Collodion	“	0	0	6

The foregoing prices are subject to variation.

From the uniform success that has attended the use of Bland & Long's Collodion in the taking of portraits and views, and the corresponding demand for it in the country and foreign parts, they have been induced to sell this article separately from the iodizing compound in any quantity, thus enabling operators whose time is limited and uncertain, and also those who reside in remote districts, to prepare the compound as required for use, obviating the necessary waste consequent on the Collodion becoming discoloured and useless by keeping.

ESTIMATES

FOR

SETS OF PHOTOGRAPHIC APPARATUS.

(The following prices do not include a supply of Silvered Plates.)

DAGUERREOTYPE APPARATUS.

		£	s.	d.
No. 1.	Set of Daguerreotype Apparatus, for taking pictures 4¼ in. by 3¼ in., 3¼ in. by 2¾ in., and 2½ in. by 2 in.; consisting of No. 1 walnut sliding body Camera, with single Achromatic Lens, mounted in brass front, dark slides for plates, ground focussing glass, &c.; Bromine and Iodine pans, with air-tight glass covers, and set of frames; 3 Plate Holders; 3 Plate Boxes; 2 velvet polishing Buffs; Mercury Box, with thermometer; Porcelain Washing Tray; Gilding Stand, with levelling screws; Improved Pliers; Glass Spirit Lamp; Funnel; Filtering Paper; with all the necessary Chemicals, and Polishing Materials, in hard wood boxes. The whole packed in two stained cases, with locks and handles	6	6	0
	Ditto, of superior construction . . .	10	10	0
	If with Compound Achromatic Lens, and double Iodine and Bromine Boxes, forming a more complete set of apparatus	15	15	0
No. 2.	Complete set of Daguerreotype Apparatus, for portraits from 2¾ in. by 3¼ in., up to 6½ in. by 4¾ in., with best Compound Achromatic Lens, mounted in handsome brass front, rackwork adjustment; sliding body Camera of mahogany, with dark frames, focussing glass, &c.; improved Compound Iodine and Bromine Box; 2 polishing Buffs; 4 Plate Boxes; 4 Polishing Blocks; Head Rest; Mercury Box, with thermometer; Washing Tray; Gilding Stand; Improved Pliers; Spirit Lamp; Funnel and Filter Paper; Hard wood boxes, containing Polishing Materials, with all the necessary Chemicals and Materials. The whole packed in two stained wood cases, with locks and handles . . .	23	0	0

ESTIMATES FOR SETS OF PHOTOGRAPHIC APPARATUS.

		£	s.	d.
No. 3.	Complete set of Daguerreotype Apparatus for taking pictures up to 8½ in. by 6½ in.; consisting of sliding body Camera, with dark frames, focussing glass, &c., Compound Achromatic Lens, mounted in handsome brass front, with rackwork adjustment; Compound Iodine and Bromine Apparatus, complete; Polishing Buffs; Plate Boxes; Polishing Blocks; Camera Stand; Head Rest; Mercury Box; Washing Pans; Gilding Stand; Improved Pliers; Spirit Lamp; Funnels; Polishing Boxes; Filtering Paper, &c.; with a good supply of all the necessary Chemicals, Materials, &c. The whole carefully packed in two cases, with locks and handles .	40	0	0
No. 4.	Complete set of Daguerreotype Apparatus, suitable for a Public Institution or a professional Photographer; comprising large Camera, with necessary slides for plates, ground focussing glass, Combination Achromatic Lens, mounted in handsome brass front, with rackwork adjustment, for taking portraits, groups, or views up to 8½ in. by 6½ in.; also a small Camera, with short focus double combination Achromatic Lens of large aperture, for taking portraits up to 4¼ in. by 3¼ in. in dull weather; Polishing Lathe, with circular Buffs; 3 hand Buffs; Set of metal Plate Holders; Heating Stand; Large Bromine and Iodine Apparatus; Set of Plate Boxes; Camera Stand; Head Rest, for chair; also Head Rest with heavy iron foot, for full-length portraits; Mercury Box, for different sized plates; Lamp, with yellow glass shade; one gallon Still, and worm tub, complete; Gilding Stands; Stoneware Filter; Porcelain Dishes and Filter Stands; Funnels and Filtering Paper; Spirit Lamps; Daguerreotype Colours and Brushes; India-rubber Bottle; Glass Measures; Two Painted Backgrounds; with a full supply of Chemicals, Polishing Materials, &c., complete	110	0	0

ESTIMATES FOR SETS OF APPARATUS FOR THE PAPER PROCESSES.

No.		£	s.	d.
No. 1.	Complete set of Calotype Apparatus; consisting of Mahogany Camera, with Achromatic Lens, 1¾ in. diameter, in brass front, for taking pictures 6 in. by 5 in., ground focussing glass, dark slide for prepared paper; Porcelain Dish; Calotype Board for preparation of paper; Glass Rod; Reversing Frame; 1 quire Photographic paper; 1 quire Bibulous ditto; Lamp, with yellow glass shade; Scales and Weights, in oak box; 1 oz. Measure; Minim ditto; with all the necessary Chemicals, &c., in stoppered bottles. The whole packed in deal case, with lock and key	5	5	0
No. 2.	Complete set of Apparatus for the Calotype or Waxed Paper process; consisting of mahogany Camera, with single Achromatic Lens, 2¼ in. diameter, mounted in brass front, with necessary diaphragms for taking pictures 7 in. by 6 in., ground focussing glass, Back for paper; 2 Porcelain Dishes; Calotype Board for preparation of paper; Drawing Pins; 2 Glass Rods; Reversing Frame; 2 quires of Photographic paper; 2 quires of Bibulous ditto; Lamp, with yellow glass shade; Scales, with set of weights from 1 grain to 2 drams, in oak box; 1 oz. Measure; Minim or drop ditto; Funnel; with all the necessary Chemicals, &c. The whole packed in case, with lock and key . . .	6	16	6
No. 3.	Complete set of Apparatus for the Calotype or Waxed Paper process; comprising mahogany Camera, with Achromatic Lens, 2⅝ in. diameter, mounted in brass front, with necessary diaphragms and sliding plate for adjustment of foreground and sky, with double back for paper 9 in. by 7 in., ground focussing glass; 2 Porcelain Dishes; Calotype Board; Drawing Pins; 2 Glass Rods; Reversing Frame for obtaining Positives; 2 quires of Photographic paper; 2 quires of Bibulous ditto; Lamp, with yellow shade; Scales and Weights; Glass Measure; Minim ditto; Funnels, &c., &c.; with all the necessary Chemicals, complete. The whole packed in case, with lock and key . .	10	10	0

ESTIMATES FOR SETS OF APPARATUS FOR THE PAPER PROCESSES.

No. 4.	Set of Calotype Apparatus; comprising a mahogany Camera, fitted with Compound Achromatic Lens, in handsome brass front, sliding plate for adjustment of proportion of foreground and sky, ground focussing glass, double back for paper, of best construction, adapted for views 9 in. by 7 in., or portraits up to 6 in. by 5 in.; 2 Porcelain Pans; Calotype Board for preparation of Paper; Drawing Pins; 2 Glass Rods; 1 oz. Glass Measure; Minim ditto; 2 Glass Funnels; Reversing Frame, for obtaining Positives; 3 quires of Photographic Paper; 3 quires of Bibulous Paper; set of Scales and Weights, with glass pans; with a full supply of Chemicals in stoppered bottles. The whole carefully packed in case, complete	16	16	0
No. 5.	Portable Calotype Apparatus; consisting of a Folding Camera of the best construction, with ground focussing glass, double back for prepared paper, single Achromatic Lens, 2¼ in. diameter, in brass front, sliding plate for adjustment of proportion of foreground and sky, adapted for pictures 7 in. by 6 in.; 2 Calotype Washing Pans; Board for preparation of paper; Reversing Frame; Drawing Pins; 2 Glass Rods; 1 oz. Glass Graduated Measure; Minim ditto; 2 Glass Funnels; 2 quires of Photographic Paper; 2 quires of Bibulous ditto; Set of Scales and Weights, with glass pans; with a full supply of Chemicals, &c. The Camera packed in leather sling case, for convenience of carriage: the Chemicals and other Apparatus in case, with lock and key	13	13	0
No 6.	The same Camera and Apparatus as foregoing, but fitted with a double Achromatic Lens, mounted in handsome brass front, with a short focus opening in Camera, &c., suitable for views 7 in. by 6 in., and portraits or near objects 6 in. by 5 in. The Camera and double back packed in leather knapsack, and the other Apparatus in case complete, with lock and key	20	0	0

ESTIMATES FOR SETS OF APPARATUS FOR THE PAPER PROCESSES.

		£	s.	d.
No 7.	Portable Folding Camera, with double back for prepared paper, 9 in. by 7 in., ground focussing glass of best construction, fitted with single Achromatic Lens, with sliding plate for adjustment of proportion of foreground and sky; Calotype Board for preparation of paper; Drawing Pins; 2 Glass Rods; 1 oz. Graduated Measure; Minim ditto; 2 Funnels; 3 quires of Photographic Paper; 3 quires of Bibulous Paper; 2 Porcelain Pans for washing paper; Reversing Frame; Set of Scales and Weights, with Glass Pans; with a full supply of Chemicals, &c. The Camera, with back and lens, packed in leather case for convenience of carriage. The Chemicals and other Apparatus in strong case, complete with lock and key .	16	16	0
No. 8.	Portable Apparatus, same as above, fitted with Compound Achromatic Lens for views, 9 in. by 7 in., or portraits and near objects, 7 in. by 6 in., with a full supply of Chemicals and materials. The Camera and backs packed in leather sling case, as also the lens; the Chemicals and Apparatus packed in separate wood case, with lock and key	30	0	0
No. 9.	Apparatus complete for views, 12 in. by 10 in., consisting of mahogany Camera, with double back for prepared paper, single Achromatic Lens, with sliding plate for adjustment of foreground and sky; Calotype Washing Pans; Boards for preparation of paper; Reversing Frame; Glass Rods; Glass Measures; 2 Funnels; 4 quires Photographic Paper; 4 quires of Bibulous ditto; Set of Scales and Weights, with glass pans; and all the necessary Apparatus, Chemicals, and Materials. The whole packed in a strong iron-bound case, with lock and key, fit for travelling .	21	0	0

ESTIMATES FOR SETS OF APPARATUS FOR THE COLLODION PROCESS.

		£	s.	d.
No. 1,	Comprising Mahogany Camera, with single Achromatic Lens, 1¾ in. diameter, in brass front; Dark Slide for plates 4 in. by 3 in., and 3¼ in. by 2¾ in.; 1 dozen each size plate; 2 Plate Boxes; Gutta Percha Bath Stand and Dipper; Washing Pan; Levelling Stand; Reversing Frame; 2 Glass Measures; Scales and Weights; with all the necessary Chemicals. The whole packed in box complete, with lock and key	5	5	0
No. 2.	Set of Apparatus, same as above, but with double Achromatic Lens, rendering it more suitable for portraits	6	10	0
No. 3.	Complete Apparatus, consisting of sliding body Camera of superior construction, with dark slide and loose frames for plates, 5 in. by 4 in., and 4 in. by 3 in., Compound Achromatic Lens, in handsome brass front; Glass Plates; Plate Boxes; Gutta Percha Bath Stand and Dipper; Washing Pan; Levelling Stand; Reversing Frame; Glass Measures; Scales and Weights; with all necessary Chemicals, bottles, &c. The whole packed in case complete, with lock and key	10	10	0
No. 4,	Consisting of sliding body Camera, best make, with ground focussing glass, dark slide with 3 loose frames for plates, 6 in. by 5 in., 5 in. by 4 in., 4 in. by 3 in., with best double combination Achromatic Lens, rackwork adjustment; Glass Plates; 3 Plate Boxes; Gutta Percha Bath Stand and Dipper; 2 Washing Pans; Levelling Stand; Reversing Frame; Glass Measures; Scales and Weights; Funnel; Filter Ring; with all the requisite Chemicals and materials. The whole carefully packed in a case, with lock and key	16	0	0
No. 5.	Complete set of Apparatus for Collodion pictures 8½ in. by 6½ in. downwards, comprising mahogany sliding body Camera of best construction, with focussing glass, dark slide with loose frames for glass plates, double combination Achromatic Lens, in handsome brass front, with rack and pinion adjustment; Glass Plates; Plate Boxes; Gutta Percha Bath and Dipper; Washing Pans; Levelling Stand; Reversing Frame; Measures; Scales and Weights; with a full supply of all the necessary Chemicals, &c. &c. The whole packed in stout case, with lock and key . . .	30	0	0

STEREOSCOPES, & STEREOSCOPIC PICTURES.

Stereoscopes are of two kinds, namely, the Reflecting Stereoscope of Professor Wheatstone, and the Lenticular or Refracting one of Sir David Brewster. They both possess the power, as their name implies, of exhibiting objects properly prepared as solids; that is to say, precisely as we see them in nature, having three dimensions—length, breadth, and thickness.

The Reflecting Stereoscope is best adapted to the display of large pictures and views; while the Lenticular one is most suited for the exhibition of portraits, architectural subjects, still life, groups of statuary, and such objects which do not suffer by being reduced to pictures of small size.

One of the most beautiful applications of Photography of late is, the taking of pictures fitted for the Stereoscope; in fact, this is the only really correct means by which we can obtain them.

			£	s.	d.
Reflecting	Stereoscopes,	for large views . .	3	3	0
Refracting	ditto,	japanned tin, with diagrams .	0	3	0
Ditto	ditto,	mahogany, " .	0	10	0
Ditto	ditto,	black wood, " .	0	12	0
Ditto	ditto,	rosewood, " .	0	15	0
Ditto	ditto,	in mahogany, very superior .	0	18	0
Ditto	ditto,	in walnut, with ivory eye pieces	1	10	0
Ditto	ditto,	maple, " "	1	12	6
Daguerreotype Pictures for ditto .		. 5s., 6s., 10s., &	0	12	0
Calotype Views on paper		2s. &	0	3	6
Transparent Albumen Pictures on glass,		5s., 7s. 6d., 9s. &	0	10	0
Large Views for Reflecting Stereoscopes,		per pair, 10s. &	0	12	0

Messrs. Bland & Long are continually adding new subjects to their stock of Stereoscopic Pictures.

STEREOSCOPIC CAMERAS.

	£	s.	d.
Pair of Combination Lenses, of the same focal length, for taking Stereoscopic portraits or views of the usual size for the Lenticular Stereoscope, by the Collodion, Albumen, or Daguerreotype processes, £7 7s., £10 10s. &	12	12	0
QUINETOSCOPE with prismatic Lenses, for Stereoscopic portraits or views	10	10	0
STEREOSCOPIC CAMERA, fitted on the plan as described in the *Photographic Journal*, and known as LATIMER CLARK's principle; arranged for portraits or views on glass, paper, or Daguerreotype plates. The price depending on the size of lens . . . £5 5s. to	30	0	0
LATIMER CLARK's principle applied to any of the usual forms of Camera . . £1 15s., £2 10s., and	4	10	0

PHOTOGRAPHIC PICTURES.

From the advance that has been made towards the perfection of the various Photographic processes, Messrs. Bland & Long are enabled to offer for sale the productions of the most skilful manipulators in the art, at moderate prices.

Their portfolios contain Photographs comprising a great variety of subject: Views taken in all parts of the Globe; Architectural Elevations; Details and Perspective Views of the finest Palaces, Churches, &c., in Venice, Russia, France, and Rome; also Views in Egypt, Syria, and the East, &c. &c., Some of these are of large size, measuring 18 in. by 14 in., 14 in. by 12 in., and so on.

These beautiful works will be found of infinite value to the Artist, Architect, and Antiquary. To the former as being the best means of educating the eye in the details of light and shadow; and to the latter as furnishing a ready method of studying inscriptions and characters on ancient monuments and edifices, without the possibility of being misled by the error of a draughtsman.

ASTRONOMICAL AND NAUTICAL INSTRUMENTS.

The Instruments which bear the above title are necessarily such as require the nicest accuracy in their manufacture, more particularly the *Object Glasses* of the Telescopes for Astronomical purposes. Great care and attention has been bestowed on this branch of the subject, and the Telescopes described below will be found to possess perfect defining powers with freedom from colour, qualities so essential to the success of Astronomical observations.

REFRACTING TELESCOPES.

	£	s.	d.
Astronomical Telescope, with Achromatic Object Glass 1½ ft. focus, mounted in brass tube, on pillar and claw stand, and astronomical and terrestrial eyepieces, complete, in French-polished mahogany case, £7 7s. &	8	8	0
Ditto, with Achromatic Object Glass 2½ ft. focus, in case, with powers	10	10	0
Ditto, with vertical rack	12	12	0
Ditto, with vertical and horizontal rack	14	14	0
Ditto, with finder and Micrometer	17	17	0
Ditto, with Achromatic Object Glass 3 ft. focus, mounted on pillar and claw stand, with 2 astronomical and 2 terrestrial eyepieces, packed in mahogany case	20	0	0
Ditto, with Object Glass 2¾ in. diameter, and 3½ ft. focal length, with vertical rack, achromatic finder, 2 astronomical and 2 terrestrial eyepieces, in mahogany case	27	0	0
Ditto, with Object Glass 2⅞ in. diameter, 3 astronomical and 2 terrestrial powers, in mahogany case	31	10	0
Ditto, with vertical and horizontal rack, and achromatic finder	36	0	0
Ditto, diameter of Object Glass 3⅛ in., and 4 ft. focal length; 3 astronomical and 2 terrestrial eyepieces, vertical and horizontal rack motions, and achromatic finder, in French-polished mahogany case	40	0	0
Ditto, mounted with Equatorial stand, for any given latitude	70	0	0
Ditto, diameter of Object Glass 3¾ in., and 4 ft. focal length, mounted with vertical and horizontal rack-work motion, achromatic finder, 3 astronomical and 2 terrestrial powers, in French-polished mahogany case	65	0	0
Ditto, Equatorially mounted	95	0	0

	£	s.	d.
Astronomical Telescope, diameter of Object Glass 3¾ in., and 5 ft. focal length; 4 astronomical and 2 terrestrial powers, with stand and jointed tube	150	0	0
Ditto, completely mounted, universal Equatorial clock movement, Micrometers, &c.	200	0	0
Ditto, diameter of Object Glass 5 in., and 7 ft. focal length	270	0	0
Ditto, completely mounted Equatorial stand, clockwork movement, Micrometers, &c.	330	0	0
Ditto, diameter of Object Glass 5½ in., and 8 ft. focal length	400	0	0
Ditto, diameter of Object Glass 6 in., and 10 ft. focal length	600	0	0

REFLECTING TELESCOPES.

	£	s.	d.
Gregorian Reflecting Telescope, mounted on brass stand, with Speculum 2½ in. diameter, and 12 in. focal length, with eyepiece, in case	6	6	0
Ditto, with Speculum 3 in. diameter, and 18 in. focal length	11	11	0
Ditto, with Speculum 4 in. diameter, and 24 in. focal length	16	16	0
Ditto, with rackwork motion	25	0	0
Ditto, with Speculum 5 in. diameter, and 3 ft. focal length, and rackwork motion	40	0	0
Ditto, with rackwork motion, on strong tripod stand, diameter of Speculum 6 in.	60	0	0
Ditto, with Speculum 7 in. diameter, and 4 ft. focal length	100	0	0
Newtonian Reflecting Telescope, with Speculum 6 in. diameter, and 7 ft. focal length	100	0	0
Ditto, with Speculum 7 in. diameter	120	0	0
Ditto, with Speculum 9 in. diameter, and 9 ft. focal length	200	0	0
Annular Micrometer, with eyepiece	1	5	0
Parallel Wire Micrometer . . . £8 8s. to	15	15	0

NAUTICAL TELESCOPES.

	£	s.	d.
Day or Night Telescopes, with Achromatic Object Glasses 2 ft. focus, with sliding drawers, £1 1s., £1 10s., £2 2s., and	3	3	0
Ditto, of improved kind, with leather bodies, sling straps, and signal flags engraved on the same, £2 10s. to	5	5	0

	£	s.	d.
Naval or Pilot Telescope, with brass sliding tubes and shade, opening to 3 ft.	5	5	0
Ditto, " 3½ ft.	6	6	0
Night Telescopes . . . . £2 2s. to	5	5	0

COMPASSES.

	£	s.	d.
Boat Compass, with Nautical floating card, in wood case	0	13	0
Ditto, in brass box, with gymbals . . . 13s. and	1	5	0
Cabin Compass, set in gymbals, to hang up inverted, the floating card being suspended on a point in the glass cover . . . . . . £1 16s. to	3	3	0
Sea or Steering Compass, with floating card, and hung in gymbals . . . . £1 5s., £1 10s., to	4	4	0
Binnacle Compasses . . . . from 12s. to	0	18	0
Azimuth Compass	4	4	0
Prismatic Azimuth Compass, with tripod stand, complete	10	10	0
Ditto, larger size, and best construction . . .	16	0	0
Marine Azimuth Compass, set in gymbals, with sights for ascertaining the angular distance of objects from the Magnetic meridian . . . £2 12s. 6d. to	15	15	0

SEXTANTS AND QUADRANTS.

	£	s.	d.
Pocket Sextant, plain	3	13	6
Ditto, with Telescope	4	10	0
Ditto, with Telescope and Supplementary Arc . .	5	10	0
Ditto, larger size	6	10	0
Leather Sling Case and Strap for Pocket Sextant . .	0	9	6
Dip Sector	12	12	0
Artificial Horizon, glass plane, in case, 21s., £2 2s., &	3	3	0
Ditto, Mercurial, with iron bottle for containing the quicksilver, in case . . . . . £4 4s. and	5	5	0
Metal Sextant, 4 in. radius, divided on silver, in case,	8	10	0
Ditto, 5 in. " "	12	0	0
Ditto, 6 in. " "	13	10	0
Ditto, 7 in. " "	15	0	0
Ditto, 8 in. " "	16	0	0
Ditto, " with double frames	17	10	0
Ebony Sextant, with **Telescope** . . £8 8s. and	9	9	0
Ebony Quadrant, single observation, divided on ivory, in case	2	2	0

	£	s.	d.
Ebony Quadrant, double observation	2	10	0
Ditto, with tangent screw to index	2	15	0
Ditto, with double tangent screw	2	17	6
Ditto, with Telescope	3	10	0
Ditto, with handle and 2 Telescopes	4	10	0
Ditto, with bell metal centres	5	5	0
Ditto, best, divided on silver, with brass arch, lever magnifier, and 2 Telescopes.	7	7	0
Transit Instrument, 24 in.	16	16	0
Ditto, with iron stand	21	0	0
Ditto, with circular brass portable stand	25	0	0
Ditto, 30 in., on iron stand	44	0	0
Ditto, large, for permanent stations	72	0	0
Variation Transit, of best construction	63	0	0
Dipping Needle “	30	0	0
Altitude and Azimuth Instrument, 15 in., of best and most improved construction, divided on silver, Altitude and Azimuth Circles 18 in. diameter, with reading Microscopes, complete	200	0	0
Ditto, with Azimuth Circle 15 in. diameter	150	0	0
Ditto, 15 in. “	130	0	0
Ditto, 12 in. “	105	0	0
Borda's Repeating Circle, 12 in.	84	0	0
Ditto, 18 in.	105	0	0

SUN DIALS.

Brass Sun Dial, 4 in. diam., arranged for any latitude,	0	10	0
Ditto, 5 in. “	0	15	0
Ditto, 6 in. “	0	18	0
Ditto, 7 in. “	1	4	0
Ditto, 8 in. “	1	10	0
Ditto, 9 in. “	2	2	0
Ditto, 10 in. “	2	10	0
Ditto, 12 in. “	3	5	0
Ditto, 12 in. “ fully divided to 2 minutes, with equation of time table	6	6	0
Ditto, 15 in. “ “ 1 minute, £7 17s. 6d and	10	10	0

	£	s.	d.
Brass Sun Dial, 18 in. diam., fully divided to 1 minute,	15	15	0
Ring Dials . . . . 18s. to	1	1	0
Universal Dial, with Compass and divided Arc of latitude, in case 2½ in. diameter	1	17	6
Ditto, 3½ in. diameter	2	10	0
Ditto, 4½ in. "	4	0	0
Ditto, 6 in. "	5	10	0

SURVEYING INSTRUMENTS.

LEVELS.

	£	s.	d.
Gravatt's Dumpy Level, 12 in., with parallel plates, but without compass, on tripod stand	11	11	0
Ditto, with silver ring, divided compass, and strong tripod stand	15	15	0
Ditto, 14 in., with round legs, and card compass	15	0	0
Ditto, with silver ring, divided compass, and stout tripod stand	17	17	0
Ditto, of larger size	20	0	0
Level, with stand, for drainage purposes	6	6	0
Level, with achromatic telescope and compass	8	8	0
Ditto, improved, 14 in. long, with tripod staff	12	0	0
Ditto, 20 in. long	14	0	0
Blundell's Drainage Level	3	3	0
Ditto, with tangent screw adjustment, and case	4	4	0
Y Level, with 10 in. telescope	9	0	0
Ditto, with compass	10	0	0
Ditto, 12 in.	10	0	0
Ditto, with compass	12	0	0
Ditto, 14 in.	12	0	0
Ditto, with compass	14	0	0
Ditto, 20 in.	16	0	0
Ditto, with compass	17	10	0
Spirit Levels, in wood frames . 2s., 3s., 4s., and	0	5	0
Ditto, mounted in brass, with best ground bubbles, 6s., 7s. 6d., 10s., 15s., 21s., and	1	10	0
Ditto, in brass case, with sights and graduated arc, useful for draining or taking inclinations	2	2	0

THEODOLITES.

	£	s.	d.
Best 7 inch Theodolite, divided on silver, with 2 telescopes, parallel plates, in mahogany case, and strong tripod staff	42	0	0
Ditto 7 inch ditto, with 1 telescope, and ordinary construction	34	10	0
Ditto 6 inch ditto, divided on silver, with 2 telescopes, parallel plates divided on silver to 20 seconds, with tangent screw adjustment	36	0	0
Ditto, with 1 telescope	29	0	0
Ditto, divided on brass, of ordinary construction . .	18	18	0
Best 5 inch ditto, divided on silver, with tangent screw adjustment	24	0	0
Ditto, of ordinary construction, divided on brass . .	16	10	0
Best 4 inch ditto, divided on silver, with tangent screw adjustment	18	18	0
Ditto, of ordinary construction, divided on silver . .	14	14	0
Ditto, divided on brass	12	12	0
Transit Theodolite, 5 inch, best	29	0	0
Ditto, 6 inch "	34	0	0
Ditto, 7 inch "	40	0	0
Everest Theodolite, 4 inch	21	0	0
Ditto, 5 inch	25	0	0
Circumferenters . . £2·10s., £4 4s., and	6	6	0
Ditto, with rackwork motion, ball and socket joint and legs . . . . £8 8s. and	10	10	0
Optical Square	1	1	0
Surveying Cross, with Staff	0	18	0
Ditto, with compass at top, superior kind . . .	1	15	0
Plane Table, with graduated scale, sights, &c., £6 10s. &	8	8	0
Prismatic Compass	3	0	0
Ditto, with azimuth glass	3	10	0
Ditto, larger size	4	14	6
Ditto, with azimuth glass	5	5	0
Miner's Dial, 6 in., with sights, in mahogany case .	3	3	0
Ditto, complete, with jointed tripod stand, and ball and socket joint . . . . . . £5 10s. and	7	7	0
Ditto, 4 in., with sights, in mahogany case . . .	2	10	0

		£	s.	d.
Miner's Dial, 4 in., without sights		2	0	0
Map Meter, for measuring the length of curved lines		0	4	6
Trochiameter, for registering the number of the revolutions of a carriage wheel	£2 2s., £3 3s., and	5	5	0
Pedometers, for measuring the space traversed by a pedestrian	£3 3s., £4 4s., and	5	5	0
Perambulators	from £9 to	15	0	0
Sopwith's Station Staff, 14 ft., portable		2	10	0
Ditto, 14 ft., painted		3	0	0
Ditto, 17 ft.		4	10	0
Gravatt's Level Staff	£3 3s. to	4	4	0
Papers for Levelling Staves	per foot	0	0	2
Ditto, Set of, for a 14 ft. portable Staff		0	3	0
Levelling Staff, 12 ft., portable, with or without level,	£1 10s. to	2	12	6
Ditto, for reading without an assistant		4	4	0
Levelling Staff, with Vane		1	8	0
Station Pointers	£6 6s. to	18	18	0
Gunter's Iron Chain, 66 ft.	10s to	0	14	6
Ditto, of extra strength, with 3 oval rings		0	18	0
Ditto, 25 ft.		0	8	6
Ditto, 50 ft.		0	14	0
Ditto, 100 ft.		1	1	0
Standard Chains	from £3 3s. to	5	5	0
Set of Arrows	2s. and	0	3	

Measuring Tapes, in leather cases, with folding handles:—
Common, 33 ft., 3s., 50 ft., 3s.6d., 66 ft., 4s.6d., 100 ft., 6s.6d.
Superior, " 5s., " 6s. " 7s.6d., " 10s.6d.

Measuring Tapes, in leather cases, with folding handles, and *Multiplying motion*:—
33 ft., 7s. 50 ft., 9s. 66 ft., 10s.6d. 100 ft., 15s.

Measuring Tapes, in black leather cases of best kind, not liable to stretch or shrink, with *Multiplying motion*:—
33 ft., 9s. 50 ft., 10s. 66 ft., 12s. 100 ft., £1.

Or, divided decimally:—
33 ft., 10s, 50 ft., 11s. 66 ft., 13s. 100 ft., £1 2s. 6d.

Spring Tapes, in brass, German silver, or fancy cases, 2s. 6d., 3s. 6d., 5s. 6d., up to 0 15 0

MATHEMATICAL DRAWING INSTRUMENTS.

MECHANICAL and Engineering Drawing occupying as it does so important a place in the education of youth in schools at the present time, it becomes necessary to provide Instruments suitable for the requirements of the Class, giving all the essentials of accuracy with moderation in cost. This point will be found to be attained in perusing the following Catalogue of the various sets of Instruments. The Architect, Engineer, and Military Surveyor will find Instruments, Scales, &c., &c., adapted to their several wants and requirements.

Messrs. BLAND & LONG, from their experience in the manufacture of Mathematical Instruments, are enabled to recommend the better class Instruments with the greatest confidence, as combining all the essentials for every description of Drawing.

	£	s.	d.
Set of Drawing Instruments, consisting of compasses with pen and pencil points, and scale of equal parts, in case . . . . 3s., 4s., and	0	5	0
Set of Drawing Instruments, consisting of pair of dividers with steel joints, compasses, pen and pencil point, drawing pen and pencil holder, with scale of equal parts . . . . . . 7s. 6d. and	0	10	0
Set of Steel-jointed Drawing Instruments, consisting of compasses with pen and pencil point, pair of dividers, bow pen, drawing pen, feeder, pencil, boxwood sector and protractor, and ebony parallel, in case . .	0	14	0
Set of Drawing Instruments, consisting of the above, with turned-cheek steel-jointed compasses, and ivory rules, in case . . . . . 17s 6d and	1	1	0
Set of Mathematical Drawing Instruments, London-made, consisting of sector-jointed compasses with pen and pencil points, dividers, bow pen, drawing pen, feeder, pencil, with boxwood sector and protractor, and ebony parallel rule, in mahogany case . .	1	11	6
Set of Sector-jointed Drawing Instruments, consisting of compasses with pen and pencil points, divider, bow pen, lengthening bar, drawing pen, feeder and pencil, boxwood sector and protractor, and ebony parallel rule, in mahogany case	1	15	0
Set of Sector-jointed Drawing Instruments, as above, but with ivory rules	2	2	0

	£	s.	d.
Set of Sector-jointed Drawing Instruments, consisting of compasses with pen and pencil points, dividers, bow pen and bow pencil, lengthening bar, drawing pen, feeder, pencil, ivory sector, protractor, and parallel rule, in mahogany case	2	7	6
Set of Sector-jointed Drawing Instruments, consisting of compasses with pen and pencil points, hair dividers, bow pen and bow pencil, lengthening bar, drawing pen, feeder, pencil, ivory sector, protractor, and parallel rule, in mahogany case, complete	2	15	0
Set of Sector-jointed Drawing Instruments, consisting of compasses with extra joint, pen and pencil point, hair dividers, bow pen and bow pencil, with extra joint, lengthening bar, 2 drawing pens, needle holder, feeder, and pencil, fully divided ivory sector and protractor, and parallel rule, in mahogany case	4	0	0
Set of Best Sector-jointed Drawing Instruments, consisting of compasses with double joints, pen, pencil, and dotting points, hair dividers, jointed lengthening bar, bow pen and bow pencil, with double joints, 2 drawing pens, dotting wheel, needle holder, feeder, and pencil, with ivory parallel rule, and fully divided ivory sector and protractor, in mahogany case, complete	6	0	0
Set of Mathematical Instruments, consisting of the above, with spring-dividers, pen and pencil in addition	7	7	0
Set of Sector-jointed Drawing Instruments, in *German silver*, consisting of compasses, pen and pencil points, dividers, bow pen, drawing pen, feeder, and pencil, with ivory sector, protractor, and parallel rules, in rosewood case, complete	2	15	0
Set of Sector-jointed Drawing Instruments, in *German silver*, consisting of compasses, pen and pencil points, dividers, lengthening bar, bow pen, drawing pen, feeder, and pencil, ivory parallel rule, sector and protractor, in rosewood case, complete	3	3	0
Set of Sector-jointed Drawing Instruments, in *German silver;* consisting of compasses, pen and pencil points, lengthening bar, bow pen and bow pencil, drawing pen, feeder, and pencil, ivory parallel rule, sector and protractor, in rosewood case	3	13	6
Set of Sector-jointed Drawing Instruments, in *German silver*, consisting of compasses, pen and pencil points, lengthening bar, hair divider, bow pen and bow pencil, drawing pen, feeder, and pencil, with ivory parallel sector and protractor rules, in rosewood case	4	4	0

	£	s.	d.
Set of Best Sector-jointed Drawing Instruments, in *German silver;* consisting of compasses with extra joint, pen, pencil, and dotting points, lengthening bar, bow pen and bow pencil, with extra joint drawing pen, needle point, feeder, pencil, ivory parallel rule, and fully divided sector and protractor, in rosewood case	5	10	0
Set of Best Sector-jointed Drawing Instruments, in *German silver;* consisting of compasses with double joints, pen, pencil, and dotting points, jointed lengthening bar, hair dividers, bow pen and bow pencil, with double joints, 2 drawing pens, dotting pen, needle point, feeder, and pencil, with ivory parallel rule, and fully divided sector and protractor, in rosewood case	7	0	0
Set of Best Mathematical Instruments; consisting of the above, with spring dividers, pen and pencil added	8	8	0
Set of Mathematical Instruments as supplied to the Addiscombe Cadets; consisting of brass sector-jointed compasses, pen and pencil points, hair dividers, bow pen and bow pencil, lengthening bar, drawing pen, feeder and pencil, ivory red-line protractor, sector, parallel rule, box marquoise scales and angle, in long mahogany case	3	3	0
Set of Mathematical Instruments, as used at the Royal Military College, Woolwich	2	12	6
Set of Mathematical Instruments, as used at King's College	2	15	0
Set of Mathematical Instruments, as used at the College of Civil Engineers, Putney	3	10	0
Complete Magazine Cases of Instruments, in brass, German silver, or electro-gilt, from £10 10s. to	50	0	0

		Brass Jointed.	Steel Jointed.
Compasses,	3 in., per pair	8d.	1s.
	4 "	1s.	1s. 2d.
	5 "	1s. 2d.	1s. 4d.
	6 "	1s 4d.	1s. 8d.
	7 "	2s.	2s. 6d.
	8 "	3s	4s.

	Brass Turned-cheek.	
Compasses,	5 in., per pair	3s.
	6 "	4s.
	7 "	5s.
	8 "	6s.

	Brass.			Electrum.		
	£	s.	d.	£	s.	d.
Sector-Jointed Dividers	0	6	0	0	7	0
Ditto, with double joints, and pull-off leg,	0	11	6	0	15	0
Ink, pencil, or wheel leg for ditto	0	4	0	0	5	0
Lengthening-bar for ditto	0	5	0	0	7	0
Bow Pens, common	0	2	6			
Ditto, best	0	5	0	0	6	6
Ditto, “ double-jointed	0	10	6	0	12	6
Ditto, “ “ needle-pointed	0	12	0	0	14	0
Bow Pencils, common	0	2	6			
Ditto, best	0	5	0	0	6	6
Ditto, “ dble.-jointed	0	10	6	0	12	6
Ditto, “ “ needle-pointed	0	12	0	0	14	0
Hair Dividers, best	0	9	0	0	10	6
Spring Dividers	0	7	6	0	7	6
Spring Bow Pen	0	8	6	0	8	6
Spring Bow Pencil	0	8	6	0	8	6
Hair Bow Divider	0	9	0	0	12	0
Large Needle Bows	0	15	0	0	18	0
Tates Bow	1	4	0	1	10	0
Drawing Pen, common, with brass handle	0	2	6			
Ditto, “ all steel	0	3	6			
Ditto, brass, with ivory handle	0	4	6			
Ditto, best jointed	0	5	0	0	6	0
Ditto, set of 6 pens, of different degrees of fineness, adapting to 1 handle	1	5	0	1	5	0
Road Pen	0	12	0	0	12	0
Dotting Pen, with wheels	0	5	0	0	6	0
Pricking or Tracing Point	0	2	6	0	3	0

	Brass.			German Silv.		
Proportional Callipers, 9 in. long	1	14	0	2	2	0
Ditto, 12 in.	2	0	0	2	10	0
Proportional Compasses, in case, 12 in. long	3	0	0	3	10	0
Ditto, 9 “	2	5	0	3	3	0
Ditto, 6 “	1	10	0	2	0	0
Ditto, with screw adjustment	2	0	0	2	10	0
Whole and half	0	17	6	1	4	0

	Brass.	Germ. Silv. £	s.	d.
Triangular Compasses	10s. to	1	1	0
Ditto, with shifting-leg . . .	15s. to	1	10	0
Elliptical Compasses . . .	£2 10s. to	4	4	0

	Brass. £	s.	d.	Germ. Silv. £	s.	d.
Beam Compass, with Micrometer adjustment, ebony bar, and ivory graduated scale .	3	10	0	4	4	0
Ditto, ordinary kind	2	5	0	2	12	6
Ditto, common	1	1	0			
Ditto, Tube	2	0	0	2	12	6
Napier's Pocket Compass, in case . .	1	8	0	1	11	6
Ditto, larger size	1	12	6	2	2	0
Pocket Turn-in Compass, in case . .	1	5	0	1	10	0
Ditto, with lengthening-bar and ivory scale of equal parts	1	15	0	2	10	0
Brunel's Tube Compass	1	15	0	2	2	0
Ditto, needle-points	1	18	0	2	5	0
Pillar Compass, with divided sheath . .	1	10	0	2	0	0
Pocket Dividers, with sheath . . .	0	8	0	0	10	0

		£	s.	d.
Centre-pieces	each	0	2	6
Crayon Holders	from	0	1	6
Knife, File, and Key		0	1	6
Drawing Pins . . . per doz., 6d., 1s,	and	0	1	6
Map Meter, for measuring the length of a curved line		0	4	6
Pantagraph, for reducing, copying, or enlarging drawings, &c., 18 in. long, brass		4	14	6
24 "		5	10	0
30 "		6	5	0
36 "		7	7	0
42 "		8	10	0
48 "		10	10	0
Wallace's Eidograph		10	10	0
Circular Protractor, best, 6 in., with tangent screw adjustment		4	10	0
Ditto, divided on silver		5	10	0
Ditto, 7 in., "		6	10	0
Ditto, 8 in., "		7	15	0

SCALES AND RULES.

				£	s.	d.
PARALLEL RULE,	6 in., ebony,	common, 10d.,	best	0	1	3
	9 "	" 1s. 9d.,	"	0	2	6
	12 "		"	0	3	0
	15 "		"	0	4	0
	18 "		"	0	5	0
	21 "		"	0	7	6
	24 "		"	0	10	0
	30 "		"	0	15	0
	36 "		"	1	0	0

	Brass mount.			German Silv.		
Ditto, ivory, 6 in., common . . .	0	3	0	0	3	6
best	0	4	0	0	5	0

ROLLING PARALLEL RULES.

PLAIN.	£	s.	d.	IVORY EDGES AND ROLLERS.	£	s.	d.
6 in. . . .	0	6	0	6 in. . . .	0	9	0
9 " . . .	0	8	0	9 " . . .	0	12	0
12 " . . .	0	10	6	12 " . . .	0	16	0
15 " . . .	0	14	0	15 " . . .	1	0	0

	Brass mount.			German Silv.		
Ditto, ivory, and fully divided protractor .	0	18	0	1	0	0

SECTORS.

			£	s.	d.
Boxwood Sector, 6 in., . .	common, 1s. 6d.,	best	0	2	0
Ivory Sector, 6 in.,	brass mounted		0	4	0
Ditto,	German silver		0	4	6
Ditto,	brass mounted, superior . .		0	5	0
Ditto,	German silver, "		0	6	0
Ditto,	brass mounted, fully divided, best .		0	6	0
Ditto,	German silver " .		0	7	0

PROTRACTORS.

		£	s.	d.
PROTRACTOR, brass, semi-circular	each	0	1	0
" boxwood, 6 in.		0	1	6
" " fully divided . . .		0	2	0
" ivory		0	4	0
" " fully divided . . .		0	6	0
" " 12 in., "		1	10	0

	£	s.	d.
Protractor, ivory, 6 in. rolling	0	18	0
" brass, semi-circular, fully divided, 10s. to	0	15	0
" " 6 in., circular . . . 18s. to	1	15	0
" " 8 in. . . . . . £1 4s. to	2	2	0
" 3 in., semi-circular, divided on transparent horn	0	1	6
" 4 in., " "	0	2	6
" 6 in., " "	0	4	0
" 4 in., circular "	0	4	0
" 5 in. " "	0	5	6
Red Line Protractor, for fortification work	0	5	6
Ditto, with scale of feet	0	7	0

CHAIN SCALES.

	£	s.	d.
12 in. boxwood Chain Scales, common make, 10, 20, 30, 40, 50, or 60 chains to the inch . . . each	0	3	0
2 in. offsets for ditto	0	1	0
12 in. boxwood Chain Scales, *best make*, 10, 20, 30, 40, 50, or 60 chains to the inch . . . . each	0	5	0
2 in. offsets for ditto	0	1	3
12 in. ivory Chain Scales, ordinary make, 10, 20, 30, 40, 50, or 60 chains to the inch . . . . each	0	7	6
2 in. offsets for ditto . . . . "	0	2	0
12 in. ivory Chain Scales, best make, 10, 20, 30, 40, 50, or 60 chains to the inch . . . . . each	0	10	0
2 in. offsets for ditto . . . . "	0	2	6
12 in. Chain Scales, best make, 80 and 100 chains to the inch . . . . each 17s. 6d. to	1	0	0
2 in. offsets for ditto . . . . . " 4s. 6d. to	0	5	6
6 in. ivory Chain Scales, best make . . . each	0	4	6
6 in. boxwood ditto . . . . "	0	2	0
Tebay's Improved Universal Plotting Scale, arranged to read off the Scales from the edge, 12 in. boxwood	0	9	0
Ditto, 12 in. ivory	0	15	0

	£	s.	d.
Ship Rules, 3 ft. long, ebony, with 2 ivory edges, with ¼ and ⅜ in. scales, divided into 12 parts . . each	1	18	0
Ditto, mahogany and boxwood . . . . . "	1	9	0
Architect's Scale, 12 in., boxwood, divided from ⅛ in. to 3 in., containing 16 scales . . . . each	0	7	6

	£	s.	d.
Architect's Scale, 12 in., boxwood, arranged to read off all the scales from the edges	0	8	6
Ditto, 12 in. ivory, divided from ⅛ in. to 3 in., containing 16 scales	0	15	0
Ditto, arranged for reading all the scales from the edges	0	16	0
Ditto, 6 in., ivory	0	7	0
PLOTTING SCALES, *(see Chain Scales.)*			
NAVIGATION SCALES, 6 in., fully divided	0	9	0
GUNTER'S Scales, boxwood, common, 1 ft., 2s. 2 ft.,	0	2	3
Ditto, best . 1 ft., 2s. 6d. 2 ft.,	0	3	0
Ditto, 5 ft., sliding	0	15	0
Scales of equal parts, 6 in., boxwood	0	0	9
Ditto, 6 in., ivory	0	2	0
Ditto, " best	0	2	6
Rules for pocket use, ivory, folding . from 2s. 6d. to	1	1	0
MARQUOISE SCALES, set of 2, with angle, in case, complete	0	13	0
Ditto, without case	0	12	0
Ditto, in ivory	2	10	0
Ditto, in metal	3	10	0
ENGINEER'S RULE, best 2 ft. jointed, with inches divided into 8ths, 10ths, 12ths, and 16ths series of scales to the inch, gun and shot scales and decimals	0	7	0
Ditto, electrum mounted	0	10	0
Ditto, ivory and electrum	1	4	0
ROUTLEDGE'S ENGINEER'S SLIDE RULE, 2 ft. in boxwood, with book of instructions	0	9	0
Ditto, in ivory	1	1	0
COGGLESHALL'S SLIDE RULE, 12 in., ivory	0	18	0
Double Interest Rule, 12 in., ivory, with double slides	2	10	0
HAWTHORN'S SLIDING RULE, with book of directions	0	12	0
Improved Bow, for drawing curves	0	15	0
STRAIGHT EDGES, steel . per foot	0	5	6
STANDARD SCALE, 1 ft., German silver	1	1	0

T SQUARES, mahogany or lancewood:—

12 in. plain,	2s. 6d.,	or with bevil,	4s.
18 in. "	3s. 6d.,	"	5s.
24 in. "	4s. 6d.,	"	8s.

T Squares, Ebony:—

12 in. plain,	3s. 6d.,	or with bevil,	5s.
18 in. "	5s.	"	6s. 6d.
24 in. "	7s.	"	8s. 6d.

		£	s.	d.
Ship Curves and Scrolls	from each	0	1	6
Acute, Obtuse, and Right Angles, in boxwood or mahogany	from 2s. to	0	5	0
Centrolinead, small size		1	8	0
Ditto, large size		1	10	0
Set of Radii Curves	£1 1s. to	5	5	0
Computing Scale		0	16	0
Improved Drawing Boards	18s. to	3	3	0

English and Foreign Standard Measures made to order.

GLOBES.

Globes, in black-stained wood-frames, for table use, Terrestrial and Celestial, with quadrant of altitude:—

	£	s.	d.
20 inch, per pair	9	10	0
15 "	6	0	0
12 "	4	0	0
9 "	3	0	0
6 "	1	15	0

Globes, mounted in mahogany frames, with quadrant of altitude;

	£	s.	d.
20 inch, per pair	10	10	0
15 "	6	10	0
12 "	4	10	0
9 "	3	10	0
6 "	2	2	0

Globes, mounted in carved rosewood frames, with quadrant of altitude:—

	£	s.	d.
20 inch, per pair	13	0	0
15 "	8	8	0
12 "	6	6	0
9 "	4	14	6

Globes, mounted in mahogany frames, with pillar and claw stand, and quadrant of altitude:—

	£	s.	d.
15 inch, per pair	7	17	0
12 “	5	10	0
9 “	3	13	6
6 “	2	12	6
3 “	2	2	0

Globes, mounted on plain mahogany pillar and claw frames, chair high, and compass at bottom, with quadrant of altitude:—

25 inch, per pair	26	0	0
20 “	14	0	0
15 “	9	9	0
12 “	6	6	0

Globes, mounted chair high, on carved mahogany pillar and claw frames, with compass boxes, double hour circles, &c., and quadrant of altitude, complete:—

25 inch, per pair	27	15	0
20 “	15	15	0
15 “	10	10	0
12 “	6	16	6

Globes, mounted chair high, with best rosewood frames, elegantly carved, and quadrant of altitude:—

25 inch, per pair	32	0	0
20 “	18	18	0
15 “	12	12	0
12 “	8	8	0

Globes, mounted in best Spanish mahogany carved frames, with double hour circles, compass, and quadrant of altitude, complete:—

25 inch, per pair	32	15	0
20 “	18	18	0
15 “	12	12	0
12 “	7	10	0

Globes, mounted in extra carved massive rosewood frames, with magnetic compasses, hour circles, and quadrant of altitude.—

25 inch, per pair	40	0	0
20 “	22	10	0

Globes, mounted on mahogany or rosewood pedestal, with semicircular brass meridian, and quadrant of altitude:—

		£	s.	d.
9 inch, each	£1 1s. and	1	4	0
6 "	9s. and	0	10	6
4½ "	6s. and	0	7	0
3 "	4s. and	0	5	0

	£	s.	d.
Pocket Globes, in wood cases, 3 in. diameter	0	16	0

Quadrants of Altitude:—

	£	s.	d.
For 20 inch Globes	0	6	0
15 "	0	4	6
12 "	0	3	6
9 "	0	3	0
6 "	0	2	0
3 "	0	1	6

	£	s.	d.
Orrery, showing the planets and satellites, diurnal and annual motion of the earth, and motion of the moon and inferior planets, moved by a winch handle, £10 10s. to	21	0	0
Orrery, showing the motion of all the planets, annual and diurnal motion of the earth, the moon's phases and nodes, mounted on mahogany frame	25	0	0
Orrery, with planetarium, tellurian, and lunarium, in brass frame	42	0	0
Orrery, *very superior and very complete;* showing the diurnal and annual motion of the earth, the sun revolving on its axis, and the motion of all the planets. Mounted in a globe frame 21 in. diameter, and set in motion by clockwork	50	0	0
Planetarium, showing the planets and their satellites, £1 10s. to	5	5	0
Tellurian, showing the motions of the earth and moon, the planets Mercury and Venus, and the obliquity of the earth's axis £3 3s. to	6	6	0

MODELS OF STEAM ENGINES.

Working Model of a *Locomotive Steam Engine* with 4 wheels, as in present use, capable of drawing a model train on a circular or straight railway	25	0	0
Working Model of a *Locomotive Steam Engine* with 6 wheels, such as used on the Great Western and other railroads	45	0	0
Model Railroads, of various lengths, for the above.			
Models of Railway Trains, consisting of tender, mail, first, second, and third-class carriages, luggage and cattle waggons and trucks, each 21s., £2 2s., £3 3s. &	5	5	0
Model of a *Turn-table*, for shifting an engine or carriages from one line on to another . . . £7 7s. and	10	10	0
Small Working Model of *Locomotive Engine and Tender*, with carriage and rails complete, £7 7s., £10 10s., and	15	15	0
Small Working Model of a *Locomotive Engine*, or *Steam Carriage*, heated with a spirit lamp, with the front wheels so arranged that they may be placed so as to travel round a circular table . . . £4 4s. and	6	6	0
Small Working Model of *Oscillating Engine*, with boiler and lamp, complete . . . . . £1 10s. and	2	10	0
Dr. Wollaston's *Steam Apparatus*, for showing the production of motion by the generation and condensation of steam	0	7	6
Working Model of a *Marine Beam Engine*, *&c.*, similar to those employed in steam-vessels . . £30 to	50	0	0
Working Model of Maudslay's *Vibrating Engine*, £20 to	35	0	0
This kind of engine is more simple and compact than any other. The beam, cross-head, connecting-rods, and parallel motion being dispensed with. They are extensively used in steam-boats on the Thames.			
Working Model of a *Steam Boat* . . . . £20 to	50	0	0
Working Model of Hero's *Rotatory Engine*, £3 13s. 6d. to	5	5	0
In this Engine motion is produced by the re-action of steam from two opposite escape-pipes, rushing into the atmosphere.			
Working Model of De Cau's *Engine* . £2 10s. and	3	13	6
Water is forced out of the boiler in a small jet by the force or pressure of the steam generated.			
Working Model of Savory's *Engine* for raising water, or drainage purposes . . . . . £5 5s. to	7	7	0

£ s. d.

Working Model of Papin's *Engine* . . £8 8s. to 15 15 0

This was the first Engine in which a piston was employed and safety-valve applied to the boiler.

Working Model of Branca's *Engine* . . £3 13s. 6d. to 5 5 0

A jet of steam impinging against a set of vanes fixed on the circumference of a wheel communicating a rotatory motion to the same.

Working Model of Newcomen's *Atmospheric Engine*, £14 to 20 0 0

A great improvement was introduced in this Engine by the addition of an oscillating beam, the end of one of its arms being attached to the piston by a rod, and from the other a rod is suspended for working a pump for raising water. The motion being supplied by steam underneath the piston, assisted by a counterpoise weight on the pump-rod raising it to the top of the cylinder, when the steam being condensed, the weight of the atmosphere forces it down again.

Working Model of Watt's *single-action Steam Engine*, £20 to 40 0 0

The improvement in this Engine consists in the substitution of steam for atmospheric pressure above the piston, forcing it to the bottom of the cylinder. The steam being admitted below the piston placing it in equilibrio, when it is raised by a slight counterpoise to the top; the steam from the bottom of the cylinder is afterwards admitted to the condenser, which was in this engine first separated from the cylinder. This was the first engine in which steam was practically employed as a direct motive power, being only used in those previously constructed as a means of producing a vacuum to admit of the atmosphere acting in a similar manner.

Working Model of Watt's *double-action Steam Engine*, £30 to 60 0 0

The additions in this Engine to the former are, the application of the power of steam alternately to both sides of the piston, forcing it up and also down, the opposite ends of the cylinder being open to the condenser. The parallel motion, crank and fly-wheel, for converting the reciprocating motion of the beam into a rotatory one, and the governor for regulating the action of the engine.

Working Model of Cartwright's *Engine* . . . 20 0 0

This Engine was designed to be worked by the vapour of alcohol, and was the first in which a metallic piston was used.

	£	s.	d.
Working Model of Wolf & Edwards' *high-pressure* and *expansive Engine* . . . . . . £30 to	50	0	0
The steam from the first cylinder of this Engine enters a larger one, where its expansive force is employed, and from whence it passes into the condenser.			
Working Model of Trevethick & Vivian's *high-pressure Engine*	8	8	0
The cylinder in this Engine is fixed vertically in the boiler; this was the first non-condensing engine brought generally into use.			
Working Model of Trevethick & Vivian's *Locomotive Steam Engine*	14	0	0
Working Model of an *Oscillating high-pressure Engine*, £4 to	7	0	0
By this arrangement the rotatory motion is communicated to the cranked axle and fly-wheel direct from the piston-rod.			

Working Models of various high-pressure Engines, such as Maudslay's, Murray's, Brunel's, Perkin's, &c., made to order.

Working Models of various Rotatory Engines, as Cartwright's, Masterman's, Galloway's, &c., made to order.

Working Models of different kinds and constructions of Marine Engines, as Seward's, Field's, Humphreys' &c., made to order.

	£	s.	d.
Working Model of Perkin's *Steam Gun*, mounted on strong copper boiler, generating steam at a pressure of 200lbs. per square inch; for projecting bullets, &c.	10	10	0

Models of Sawing, Sugar, and Rolling Mills, Coining Presses, and Tilt Hammers, adapted to be worked by Model Steam Engines, made to order.

	£	s.	d.
Marcet's *Steam Apparatus;* consisting of iron boiler on stand, thermometer, barometer, tube, stopcock and jet, complete, adapted for illustrating the theory of latent heat, and the phenomenon of the elastic force of steam, generated under high pressure . . .	3	13	6
Ure's *Steam Apparatus*, for demonstrating the same phenomena as Marcet's Apparatus, at temperatures above and below the boiling point of water . .	3	15	0
Painted Sectional Model of Bolton & Watt's *Single Acting Engine, Boiler and Furnace*, showing the action of the pistons, valves, cock, tappets, pumps, &c., set in motion by the hand. Size of engine 3½ feet long by 3 feet high, boiler 3 feet long .	12	12	0

	£	s.	d.
Painted Wooden Model of Bolton & Watt's *Double Acting Steam-Engine, Boiler and Furnace*, showing the exterior of the engine and the working parts, such as the cylinder, condenser, air-pump, valves, &c., and separating, showing their action in section, motion being communicated by the fly-wheel. Size of engine 4½ feet long by 4-feet high; boiler 5½ feet long	25	0	0
Painted Sectional Model of Bolton & Watt's *Double Acting Steam-Engine, Waggon Boiler and Furnace*, showing all the working parts in motion. Size of engine 3½ feet long by 3 feet wide; boiler 3 feet long	13	13	0
Painted Sectional Model of Maudslay's *Vibrating Condensing Engine*, 2 feet wide and 3 feet high	6	6	0
Painted Sectional Model of a *High-pressure Engine and Cornish Boiler*. Size of engine 2 feet wide and 3 feet high, and boiler 2½ feet long	10	0	0
Painted Wooden Model of Bolton & Watt's *Marine Engine*, 3½ feet long and 3 feet wide	10	0	0
Ditto, with boiler and furnace flues, boiler 3½ feet long	14	14	0
Painted Sectional Model of Wolf & Edwards' double cylinders, nozzles, valves and condenser, for their high-pressure and expansive engine	6	0	0
Painted Sectional Model of a cylinder, slide valve and condenser, illustrating the action of the piston and slide valve, and the distribution of the steam in the cylinder	3	10	0
Painted Sectional Model of a *Cornish Steam Boiler*, dissecting to show the arrangement of all the flues, tubes, and general section of the boiler	7	7	0
Working Models of different kinds of pistons for steam-engines, cylinders 9 inches in diameter	2	10	0
Wooden Model of the Puppet, or T valve	1	10	0
Ditto, of short slide valve, separating to show its interior arrangement	1	10	0
Ditto, of D valve, separating as above	2	5	0
Ditto, of 4-way cock, on plain surfaces	0	15	0
Painted Wooden Model of Maudslay's *4-way cock*, taking apart to explain its construction	2	5	0

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